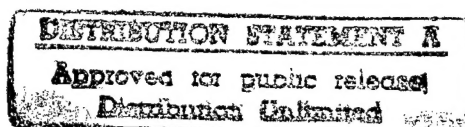




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# ***JPRS Report***



# **Science & Technology**

***Central Eurasia:  
Life Sciences***

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# Science & Technology

## Central Eurasia: Life Sciences

JPRS-ULS-92-025

### CONTENTS

25 November 1992

#### Agricultural Science

Morphogenetic Activity of Transgenic and Normal Potato Roots in in Vitro Culture [V. A. Avetisov, A. M. Stefanovich, et al.; BIOTEKHNOLOGIYA, No 2, Mar-Apr 92]	1
Investigation of Effect of Low-Intensity Laser Radiation on <i>Saccharomyces cerevisiae</i> Yeast [A. M. Kuts, T. I. Romanovskaya, et al.; BIOTEKHNOLOGIYA, No 2, Mar-Apr 92]	1
Isolation and Crystallization of Bacterial Luciferase [A. M. Katsev, Yu. S. Krivoshein, et al.; BIOTEKHNOLOGIYA, No 2, Mar-Apr 92]	1
Some Aspects of Immunospecific Detection of Paprin in Atmospheric Air [G. I. Kondrashev, Ye. G. Khimchuk, et al.; BIOTEKHNOLOGIYA, No 2, Mar-Apr 92]	1

#### Biochemistry

Determination of the Spatial Structure of the Insectotoxin 15A Buthus Eupeus by <sup>1</sup> H NMR Spectroscopy [A.L. Lomize, V.N. Mayorov, et al.; BIOORGANICHESKAYA KHIMIYA, Vol 17 No 12, Dec 91]	2
Isolation of Recombinant Interleukin-3 Produced by E. Coli [S.V. Lutsenko, A.I. Gurevich, et al.; BIOORGANICHESKAYA KHIMIYA, Vol 17 No 12, Dec 91]	2
Effect of pH Changes on Latrotoxin Channels [Ye.A. Petrushenko, L.G. Storchak, et al.; BIOKHIMIYA, Vol 57 No 5, May 92]	2

#### Biophysics

Reprotonation of Chromophoric Groups of Bacteriorhodopsin: Spectral and Electrical Analysis [S.V. Danshyna, L.A. Drachev, et al.; BIOKHIMIYA, Vol 57 No 5, May 92]	4
Effects of Arg-82→Gln and Arg-227→Gln Exchanges on Bacteriorhodopsin Function [L.A. Drachev, A.D. Kaulen, et al.; BIOKHIMIYA, Vol 57 No 5, May 92]	4

#### Biotechnology

Higher Plant Mutants: Alterations in Sterol Synthesis [L.A. Lutova, Ye.A. Levashina, et al.; GENETIKA, Vol 28 No 3, Mar 92]	5
--	---

#### Environment

Cloning of Phenol-Degrading Genes of <i>Pseudomonas</i> sp. 5-T [A.N. Kulakova, L.A. Kulakov, et al.; GENETIKA, Vol 28 No 2, Feb 92]	6
Immune Status and Health of Children in Arals [Ye. T. Dadambayev, I. G. Dauranov, et al.; ZDRAVOOKHRANENIYE KAZAKHSTANA, No 3, Mar 92]	6
Ecological and Medical Aspects of Kazakhstan's Arid Zones [T. S. Dzhasybayeva; ZDRAVOOKHRANENIYE KAZAKHSTANA, No 3, Mar 92]	7
Heavy Metals in Aquatic Macrophytes in Northern Latvian Rivers and Lakes [M. Klavins, A. Urtans, et al.; LATVIJAS ZINATNU AKADEMIJAS VESTIS, No 5, May 92]	9
Trace Metal Complexation in Latvian Aquatic Systems [M. Klavins, U. Cinis; LATVIJAS ZINATNU AKADEMIJAS VESTIS, No 5, May 92]	9
Environmental Aspects of CFC Use in Production of Rigid Polyurethane Foams [U.K. Stirna, P.I. Solodovnik, et al.; LATVIJAS ZINATNU AKADEMIJAS VESTIS, No 5, May 92]	9
Pressing Problems in Sanitary Control of Water Resources and Soil [O.I. Voloshchenko, V.A. Prokopov, et al.; GIGIYENA I SANITARIYA, No 9, Sep 91]	9
Virus Collection Stolen From Sukhumi Laboratory [D. Polikarpov; KOMSOMOLSKAYA PRAVDA, 23 Oct 92]	12
Officials Note Worsening Environmental Situation; Birthrate Decline [INTERFAX 8 Oct]	13
Russia: Pollution in Vladimir Causes Tumors in Infants	13

## Epidemiology

### Course of Influenza A Epidemics in Kazakhstan

[A. T. Ismagulov, A. G. Nazhmedenova, et al.; ZDRAVOOKHRANENIYE KAZAKHSTANA, No 3, Mar 92] ..... 14

## Genetics

### SPECTAT: Miniset Programs for Statistical Analysis in Population Genetics

[Yu.F. Kartavtsev, A.A. Solovyev; GENETIKA, Vol 28 No 3, Mar 92] ..... 16

## Immunology

### Epidemiological Use of Modified Radioimmunoassay Test for HIV-1 Antibodies

[E.V. Karamov, V.A. Lukashov, et al.; IMMUNOLOGIYA, No 1, Jan-Feb 92] ..... 17

### Cross-Reaction in Radioimmunoassay Between HIV-1 and HIV-2

[V.V. Lukashov, V.A. Slepishkin, et al.; IMMUNOLOGIYA, No 1, Jan-Feb 92] ..... 17

### Zidovudine Immunorehabilitation in Pediatric AIDS

[L.P. Silyakina, E.N. Simovyan, et al.; IMMUNOLOGIYA, No 1, Jan-Feb 92] ..... 17

## Medicine

### Changes in Psychophysiological Characteristics in Visual System With Different Retina and Visual Nerve Pathology in Humans With Low Vision as Result of Transcutaneous Stimulation of Visual Path Periphery

[V. B. Polyanskiy, G. L. Ruderman, et al.; SENSORNIYE SISTEMY, Vol 6 No 2, Apr-Jun 92] ..... 18

## Microbiology

### New Concepts of Structure and Biogenesis of Intracytoplasmic Membranes of Methane Oxidizing Bacteria Methylobacterium rubrum

[V. V. Stepanyuk, T. P. Kryshchak, et al.; MIKROBIOLOGICHESKIY ZHURNAL, Vol 53 No 5, Sep-Oct 91] ..... 19

### Detection of Seroconversion to Tick-Borne Encephalitis

[R. Z. Kuzyayev, L. K. Yaroshenko, et al.; KLINICHESKAYA LABORATORNAYA DIAGNOSTIKA, No 1-2, Jan-Feb 92] ..... 19

## Military Medicine

### The Contemporary State of Vaccinal Prevention of Natural Smallpox in the Armed Forces of Capitalist States

[V. I. Evstigneev, A. I. Polozov, et al.; VOYENNO-MEDITSINSKIY ZHURNAL, No 11, Nov 91] ..... 20

## Pharmacology, Toxicology

### Facilitation of Motor Recovery in Partially Decorticated Rats by 2G Centrifugal Force

[I.B. Ptitsyna, V.V. Tselikova; BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY, Vol 111 No 6, Jun 91] ..... 23

### Quantitative Estimates of Influences of Efferent Copy and Extraocular Proprioception on Visual Evoked Potentials Before and During Horizontal Saccade in Cat

[B. Kh. Bazyan; SENSORNIYE SISTEMY, Vol 6 No 2, Apr-Jun 92] ..... 23

### Dalargin-Binding Synaptic Proteins in Rat Brain: Isolation and Comparison With Opiate Receptors

[G.A. Izykova, N.P. Taranova; BIOKHIMIYA, Vol 57 No 5, May 92] ..... 23

### Detection and Properties of Serotonin-Modulated Protein Fraction Vis-A-Vis Avoidance Behavior in Rats

[G.G. Gasanov, A.A. Mekhtiyev; BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY, Vol 111 No 6, Jun 91] ..... 23

### Modulation of Adrenergic Control of Heart Rhythm by Delta-Sleep Peptide

[L.S. Ulyaninskiy, M.A. Zvyagintsev; BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY, Vol 111 No 6, Jun 91] ..... 24

Cytochemical Evidence of Short- and Long-Term Activation of Dopaminergic System in Rat Brain [L.M. Gershteyn, T.L. Chebotareva, et al.; BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY, Vol 111 No 6, Jun 91] .....	24
--	----

## Public Health

'Ukrmedbioprom' Director on Measures To Increase Pharmaceutical Supplies [Valeriy Pechayev; PRAVDA UKRAINY, 13 May 92] .....	25
Invalids' Statement on Medical Shortages [RABOCHAYA TRIBUNA 16 Jun 92 p 2] .....	26
Tajikistan Decree on Pharmaceuticals Supply [S. Kendzhayev; NARODNAYA GAZETA, 4 Mar 92] .....	26
Uzbek Educator on Medical Training [Kh. Karimov; PRAVDA VOSTOKA, 9 Jun 92] .....	28
St. Petersburg Contemplates Pharmacy Development Program [SANKT-PETERBURGSKIYE VEDOMOSTI, 15 May 92] .....	30
Russo-German Medical University Proposed [Ya. Yurova, O. Zlobin; ROSSIYSKAYA GAZETA, 4 Jul 92] .....	30
Heart Disease Campaign in Kiev [V. V. Zboromirskiy Interview; VECHERNIY KIEV, 13 Apr 92] .....	31
Russian Medical Aid to Tiraspol [A. Shitikov; ROSSIYSKAYA GAZETA, 3 Jul 92] .....	32
American To Open Plastic Surgery Center in Moscow [M. Levashova; NEZAVISIMAYA GAZETA, 9 Jul 92] .....	33
'Phillips' Scandal Jeopardizes Reconstruction of Hematology Center [D. Frolov; NEZAVISIMAYA GAZETA, 9 Jul 92] .....	33
Commission Studies 'Farmatsiya' [N. Kochizhov, B. Zaks, et al.; ZABAYKALSKIY RABOCHIY, 11 Mar 92] .....	34
Officials Discuss Pharmaceutical Supply Problems [B. Sormolotov, V. Yakovlev, et al.; ZABAYKALSKIY RABOCHIY, 11 Mar 92] .....	36
New Medical Center in Murmansk [POLAYARNAYA PRAVDA, 19 Apr 92] .....	39
Radiation Center Planned for Bryansk [V. Prokofyev; TRUD, 24 Apr 92] .....	40
Academician on Infant Mortality, Health [Vyacheslav Tabolin; OGONEK, No 18-19, May 92] .....	40
Interview With Biopreparat Official [Yu. T. Kalinin; PRAVDA, 15 Oct 92] .....	42



### Morphogenetic Activity of Transgenic and Normal Potato Roots in *in Vitro* Culture

937C0040A Moscow BIOTEKHNOLOGIYA in Russian  
No 2, Mar-Apr 92 (manuscript received 21 Oct 91) pp 6-9

[Article by V. A. Avetisov, A. M. Stefanovich, and O. S. Melik-Sarkisov, All-Union Agricultural Bioengineering Scientific Research Institute, All-Union Academy of Agricultural Sciences imeni V. I. Lenin; UDC 582.951.4.083.5]

[Abstract] The regenerating capabilities of transgenic and normal roots from four different varieties of potato (Domodedovskiy, Zarevo, Gatchinskiy, and Yantarnyy) were investigated using the  $A_4$  strain of *A. rhizogenes*. It was shown that shoots from both transgenic and normal roots appeared earliest on a medium with zeatin and indolyl acetic acid in concentrations of 1 mg/l. However, the regeneration processes in the transgenic roots were not as active as in normal roots. The differences in the regeneration capabilities of transgenic and normal plants were attributed to their different origins and varietal aspects. In addition, the data suggest that indolyl acetic acid is necessary in the regeneration medium to produce shoots from transgenic roots. It was also shown that high concentrations of zeatin (3 mg/l) decreased the number of transgenic root shoots able to regenerate and the number of regenerants per explant, and increased the time necessary to induce shoots. In conclusion, the authors recommend the Yantarnyy and Zarevo varieties, since they have transgenic roots with a high regeneration capability that makes them a convenient model for studies on genetic transformation in potatoes. Figures 3; tables 3; references 10: 6 Russian, 4 Western.

### Investigation of Effect of Low-Intensity Laser Radiation on *Saccharomyces cerevisiae* Yeast

937C0040B Moscow BIOTEKHNOLOGIYA in Russian  
No 2, Mar-Apr 92 (manuscript received 03 Jun 91) pp 27-29

[Article by A. M. Kuts, T. I. Romanovskaya, I. A. Romanovskiy, and V. F. Sukhodol, Kiev Technology Institute of the Food Industry; UDC 663.14.038.3:615.849.19]

[Abstract] The effect of low-intensity helium-neon ( $\lambda$  632.8 nm) and helium-cadmium ( $\lambda$  441.6 nm) laser radiation on *S. cerevisiae* yeast (1 g in 20 ml tap water) was investigated. It was shown that the greater the radiation dose, the greater the decrease in the level of unfermented sugars in the beer. This was attributed to the stimulating effect of laser radiation on the enzymatic activity of the yeast cells responsible for the synthesis of ethanol and biomass. The activation of brewer's yeast race V-30 with helium-cadmium laser radiation increased their productivity of ethanol and biomass more than did the helium-neon laser with half the radiation to produce twice as much ethanol. The use of the helium-cadmium laser at 2.5 and 5 minute exposures was more effective from the point of view of increasing brewer's yeast productivity for total biomass and alcohol. Tables 4; references 10: Russian.

### Isolation and Crystallization of Bacterial Luciferase

937C0040C Moscow BIOTEKHNOLOGIYA in Russian  
No 2, Mar-Apr 92 (manuscript received 21 Oct 91) pp 33-35

[Article by A. M. Katsev, Yu. S. Krivoshein, and L. Yu. Berzhanskaya, Crimea Medical Institute, Simferopol; UDC 577.188.54:577.112.088]

[Abstract] An investigation of the connection between the processes of crystallization of bacterial luciferase and the degree and methods of purifying it was conducted by tracing the differences in the crystal formation of luciferase isolated from the marine bacteria *Ph. fischeri* and genetically engineered *E. coli* (*lum.*). The crystals were grown for 1 month at 4°, measured 0.05-0.1 mm in size, and were visible under a polarization microscope. It is currently believed that luciferase is a multi-enzyme complex consisting of three proteins that function together. The results showed that luciferase purification on QAE-sephadex A-25 does not alter its structure or organization in *Ph. fischeri*, but found that decreased stability of the multi-enzyme complex is typical of luciferase isolated from *E. coli* (*lum.*). In conclusion, crystals are obtained from the *Ph. fischeri* luciferase after the first stages of purification with a low protein concentration in the medium, which is associated with the higher stability of the enzyme complex in this species of bacteria. Figures 1; tables 2; references 9: 4 Russian, 5 Western.

### Some Aspects of Immunospecific Detection of Paprin in Atmospheric Air

937C0040D Moscow BIOTEKHNOLOGIYA in Russian  
No 2, Mar-Apr 92 (manuscript received 25 Nov 91) pp 53-55

[Article by G. I. Kondrashev, Ye. G. Khimchuk, I. B. Goncharuk, Ye. V. Korochkina, I. V. Domaradskiy, All-Union Biological Engineering Scientific Research Institute, Moscow; UDC 614.7:636.087.74]

[Abstract] The objective of this study was a more detailed investigation of an antigen that reacts with specific antibodies and its properties, which are significant from the point of view of immunochemical detection of paprin in atmospheric air samples. Rabbits were immunized with paprin or *Candida maltosa* cells to produce specific antibodies for enzymeimmunoassay. Spectral analysis showed that the paprin extract absorbs light at  $\lambda$  260 nm, which indicates the presence of nucleic acids. However, the spectrum of the partially purified antigen lacked absorption bands for nucleic acids or proteins, which also confirms that it is a polysaccharide. Gas chromatography revealed that mannose dominates in its composition. The data also suggest that the antigenic material extracted from paprin samples is composed of macromolecular carbohydrate fragments of cell walls and is similar to the mannose antigen of *Candida* sp. yeast. In conclusion, the findings indicate that the antigen extracted from paprin for immunophenotypic analysis is a polysaccharide. Finally, the conditions of extraction may significantly alter the antigen yield and affect the reliability of assaying for paprin in samples. Figures 3; references 9: 6 Russian, 3 Western.

### Determination of the Spatial Structure of the Insectotoxin 15A *Buthus Eupeus* by $^1\text{H}$ NMR Spectroscopy

937C0005A Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 12, Dec 91 (manuscript received 4 Jul 91) pp 1613-1632

[Article by A.L. Lomize, V.N. Mayorov, and A.S. Arsenyev; UDC 577.322.5:577.112.012.6:543.422.25]

[Abstract] The technique of  $^1\text{H}$  NMR spectroscopy was used to determine the spatial structure of the insectotoxin 15A from the scorpion *Buthus Eupeus*. The structural description presented in this article is a full atomic representation based on all available published NMR data on 15A *Buthus Eupeus*, including the results of an in-depth study by the method of 2D- $^1\text{H}$  NMR spectroscopy and a published analysis of its local structure. Specifically, the analysis presented herein was based on 386 Overhauser nuclear effect contacts and 113 restraints on the torsion angles  $\phi$ ,  $\psi$ , and  $\chi$  of the polypeptide chain that were obtained in the cited studies of the local structure of insectotoxin 15A. Data on the deuterium exchange of NH amide protons were also used. The calculations were made by using the DIANA distance geometry algorithm followed by a restrained energy minimization by the CHARMM program. The structure of insectotoxin 15A was found to consist of 35 amino acid residues and four disulfide bonds. A set of 20 low-energy conformations satisfying the experimental constraints established were obtained. The mean square scattering with respect to the coordinates amounted to 0.64  $\pm$  0.11 angstroms for the atoms of the main chain and 1.35  $\pm$  0.20 angstroms for all of the nonhydrogen atoms. The spatial structure of insectotoxin 15A was found to include a Pro<sup>10</sup>-Cys<sup>20</sup>  $\alpha$ -spiral and an antiparallel  $\beta$ -sheet that in turn consists of three strands (Cys<sup>2</sup>-Cys<sup>5</sup>, Gly<sup>24</sup>-Gly<sup>28</sup>, and Pro<sup>29</sup>-Cys<sup>33</sup>). All of the disulfide bonds were quite similar to one another from both an energy and a geometric standpoint and were thus difficult to differentiate from one another even by the use of NMR data. Two of the bonds (i.e., Cys<sup>2</sup>-Cys<sup>19</sup> and Cys<sup>20</sup>-Cys<sup>33</sup>) were identified unequivocally, whereas the other two (Cys<sup>5</sup>-Cys<sup>26</sup> and Cys<sup>16</sup>-Cys<sup>31</sup>) were determined from calculations and by structural analogy with "short" and "long" scorpion toxins that are homologous to insectotoxin 15A and that are characterized by an identical relative arrangement of their  $\alpha$ -spiral and  $\beta$ -sheet. Figures 9, tables 11; references 37: 8 Russian, 29 Western.

### Isolation of Recombinant Interleukin-3 Produced by *E. Coli*

937C0005B Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 12, Dec 91 (manuscript received 24 May 91) pp 1649-1655

[Article by S.V. Lutsenko, A.I. Gurevich, V.Yu. Kanevskiy, V.A. Smirnov, I.V. Nazimov, T.L. Azhikina, I.P. Chernov, V.M. Rostapshov, N.V. Sonina, and A.V. Azhaye, Khimtek Small Joint Venture, Moscow, and Bioorganic Chemistry Institute imeni M.M. Shemyakina, USSR Academy of Sciences, Moscow; UDC 577.112.088.3]

[Abstract] A synthetic human interleukin [hIL3] gene was cloned in the plasmid pTE2IL3 in which gene transcription was controlled by the promoter ( $P_{\text{VIM}}$ ) and fd phage terminator and with the help of the T7 phage gene 10 translational enhancer. The recombinant hIL3 was produced from a culture of HB101 *E. coli* producer with the plasmid pTE2IL3 under constitutive biosynthesis conditions. The accumulation of recombinant hIL3 (in the inclusion bodies) reached 30 to 40 percent of the total cell protein. The culturing was conducted for 20 hours at 37°C so as to achieve the highest hIL3 content in the total lysate while achieving a high cell density in the culture ( $A_{260}$ , 4-5). Under these conditions, the hIL3 was accumulated in the bacterial cells in the form of insoluble protein complexes (i.e., inclusion bodies). The inclusion bodies were purified by rinsing the preparation successively with solutions of Triton X-100 and urea, which stabilized the impurity effectively. A crude inclusion body preparation was then obtained by subjecting the producer cells to centrifugation, rinsing, suspension in a buffer (50 mM  $\text{Na}_2\text{HPO}_4$ , 0.2 M NaCl, and 5 percent glycerin), and destruction by ultrasound. The inclusion body-containing residue was removed by centrifugation and rinsed twice in a solution of Triton X-100 and a second buffer (50 mM  $\text{Na}_2\text{HPO}_4$ , 10 mM EDTA, and 5 M urea). This processing made it possible to remove most of the ballast proteins from the inclusion body preparation. Because a significant portion of the impurities was not solubilized by Triton X-100, a procedure of four additional rinses in a solution of urea in the second buffer was used. This procedure resulted in highly purified hIL3 inclusion bodies with minimal losses of the target protein. The procedure proved to be simple and to result in reduced losses during the renaturing process. The hIL3 solution was solubilized in 5 M GnHCl, renatured, and purified to homogeneity in a single chromatographic step. The protein yield amounted to 34 mg/g wet cells. The hIL3 from the inclusion body extract did not manifest biological activity. After dialysis, however, it manifested a specific biological activity of  $10^5$  units/mg. No reduction in the biological activity of the isolated hIL3 was observed after two weeks of storage in a third buffer at 4°C or after several months of storage at -20 and -70°C. Fifteen cycles of freezing and thawing did not reduce the biological activity of the hIL3 either. Figures 4, table 1; references 12: 1 Russian, 11 Western.

### Effect of pH Changes on Latrotoxin Channels

937C0028B Moscow BIOKHIMIYA in Russian Vol 57 No 5, May 92 (manuscript received 15 Jul 91) pp 687-693

[Article by Ye.A. Petrushenko, L.G. Storchak, N.G. Gimmelreykh and V.K. Lishko, Institute of Biochemistry imeni A.V. Palladin, Ukrainian Academy of Sciences, Kiev; UDC 577.352.4]

[Abstract] An analysis was conducted on the importance of the proton gradient in formation and function of  $\alpha$ -latrotoxin channels in synaptosomes isolated from rat brains, using a fluorescent probe (BCEF; 2,7-bis(carboxyethyl)-5(6)-carboxyfluorescein). Intrasyntosomal pH was found to be 7.16 and directly responsive to

changes in external pH. Raising or lowering the pH by 0.1-0.3 units did not significantly affect Ca ion influx along the latrotoxin channels. Reduction of external pH to 6.0 inhibited Ca ion transport. Dissipation of the proton gradient (0.1 M KCl +  $2 \times 10^{-8}$  M nigericin) precluded channel

formation but did not affect Ca ion transport along pre-formed channels. The data were consistent with an interpretation that protonation of selected sites in the latrotoxin channels diminished their capacity for supporting Ca ion transport. Figures 4; references 14: 5 Russian. 9 Western.

### Reprotonation of Chromophoric Groups of Bacteriorhodopsin: Spectral and Electrical Analysis

937C0028C Moscow BIOKHIMIYA in Russian Vol 57  
No 5, May 92 (manuscript received 12 Sep 91) pp 738-748

[Article by S.V. Danshyna, L.A. Drachev, A.D. Kaulen and V.P. Skulachev, Scientific Research Institute of Chemical Biology imeni A.N. Belozerskiy, Moscow State University; UDC 577.151.44]

[Abstract] Double-flash (Nd laser pulses, 532 nm, 15 nsec, 30 mJ) experiments on Halobacterium halobium purple membranes indicated that the P(N) photointermediate does not undergo transformation to the long-lived M412 intermediate. In addition, two types of M412 intermediates were identified in the photocycle, one dependent on light intensity and one not. The intensity-dependent M species were formed as a result of slow  $M \rightarrow N$  transition due to conformational restrictions on bacteriorhodopsin (BR) molecules by adjacent molecules in the rigid purple membrane. Existence of intensity-independent long-lived M intermediates was attributed to a rapidly established equilibrium between M and N photointermediates and slow  $N \rightarrow BR$  transition. Photoelectric signals recorded from purple membranes adsorbed on collodion films demonstrated that both  $M \rightarrow N$  and  $N \rightarrow$  native BR transformations are electrogenic processes. Consequently, this observations indicates that the intraprotein proton donor is located between the Schiff base moiety and the cytoplasmic surface of the purple membrane. Therefore, decay of M intermediate can be attributed to proton transfer from from the intraprotein donor to the Schiff base, and decay of the N intermediate is due to protonation of the donor by aqueous protons.

Finally, reversibility of  $M \rightarrow N$  transition appears to explain the mechanism of action of externally applied electric fields in promoting decay of the M intermediate. Figures 7; references 35: 7 Russian, 28 Western.

### Effects of Arg-82→Gln and Arg-227→Gln Exchanges on Bacteriorhodopsin Function

937C0028D Moscow BIOKHIMIYA in Russian Vol 57  
No 5, May 92 (manuscript received 12 Sep 91) pp 749-757

[Article by L.A. Drachev, A.D. Kaulen, Kh.G. Korana, T. Mogi, N.V. Postanogova, V.P. Skulachev and L.Zh. Stern, Scientific Research Institute of Physicochemical Biology imeni A.N. Belozerskiy, Moscow State University; UDC 577.151.44]

[Abstract] Site-directed mutagenesis was used to produce bacteriorhodopsin (BR) with arg-82→Gln and arg-227→Gln substitutions. Nd laser pulse (532 nm, 15 nsec, 5 mJ) studies showed that both bacteriorhodopsin (BR) species formed photointermediate M412 at pH 7.9-8.2 at rates comparable with native BR. Decay of M412, however, was ten-fold slower in the case of the Arg-227→Gln BR than in native and Arg-82→Gln BR at pH 5-11. Furthermore, pK values for transition to the blue acid form were 4, 5 and 8 for native BR, Arg-227→Gln BR and Arg-82→Gln BR, respectively. These findings indicate differences in the protonation of a group that may serve as a counterion to a protonated Schiff base and/or as a proton acceptor from a Schiff base. The data also showed that the Arg-82 and Arg-227 residues are irrelevant to proton transport in the BR molecule per se, but do expand the pH spectrum in which proton transport can occur. Figures 5; references 33: 4 Russian, 29 Western.

**Higher Plant Mutants: Alterations in Sterol Synthesis**

927C0507C Moscow *GENETIKA in Russian* Vol 28 No 3, Mar 92 (manuscript received 05 Apr 91) pp 129-136

[Article by L.A. Lutova, Ye.A. Levashina, L.V. Bondarenko, N.L. Bayramova, Ye.V. Andronova and S.G. Inge-Vechtomov, Chair of Genetics and Selection, St. Petersburg State University; UDC 575.224:581.143.6:581.554]

[Abstract] Description is provided of studies carried out with tobacco and pea regenerants from calluses—selected for nystatin or phenpropymorph resistance, respectively—as a means

of biological control of insects. The results showed that the regenerant plants synthesized sterols in different proportions from the parental types, while testing with the *Drosophila*-plant technique demonstrated that the difference in sterol composition had an adverse effect on the flies. The latter included morphological and developmental aberrations in the *Drosophila*, as well as diminished female fertility. Consequently, this approach to insect control appears to be a viable option as an environmentally safe and effective means of controlling crop pests. Figures 1; tables 4; references 9: 4 Russian, 5 Western.

### Cloning of Phenol-Degrading Genes of *Pseudomonas* sp. 5-T

927C0507B Moscow GENETIKA in Russian Vol 28 No 2, Feb 92 (manuscript received 19 Feb 91; in final form 12 Apr 91) pp 35-42

[Article by A.N. Kulakova, L.A. Kulakov, A.V. Naumov, O.V. Maltseva, L.A. Golovleva and A.M. Boronin, Institute of Biochemistry and Physiology of Microorganisms, Russian Academy of Sciences, Pushchino; UDC 579.841.11-252.5]

[Abstract] *Pseudomonas* sp. 5-T phenol hydroxylase gene was transferred by means of plasmid RP4::mini-Mu (pULB113) to *Pseudomonas putida* since the Phe<sup>+</sup> trait is not transferable by conjugation. The resultant Phe<sup>+</sup> transformants efficiently utilized phenol and several chlorophenols. In addition, the phenol hydroxylase gene was demonstrated to be closely linked to adenine requirements. Finally, cloning the gene into pSP329—a plasmid with a broad host range—made possible its transfer to and expression in *Escherichia coli*. Figures 2; tables 3; references 15: 4 Russian, 11 Western.

### Immune Status and Health of Children in Arals

937C0027A Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 92 pp 7-8

[Article by Ye. T. Dadambayev, I. G. Dauranov, A. T. Bekazhanova, and U. A. Zhankuzhayev, Alma-Ata Medical Institute; UDC 61:312/313-612.017.1-612.1-614.2]

[Text] Life in the Arals is difficult due to soil salinization, the shortage of potable water, and dust in the air which, along with pesticides that billow up from the bottom of the Aral, is inhaled during dust storms. An area of 26,000 square kilometers of the bottom has been uncovered due to the shortage of water resources. If we also take into account the increasing continental climate and the impoverishment of the diet, the reasons become clear for the high morbidity among local dwellers, the slow physical development of children, and the shortened average life span. It is no accident that it has been proposed that the Arals region be officially declared an ecological disaster.

One of the serious problems delaying an improvement in the effectiveness of therapeutic and prophylactic aid in the Arals is, in particular, the lack of information about the aspects of the body's immunologic homeostasis in the given ecological situation. The complex evaluation of an expanded blood leukogram, which also includes information about T-, B-, and O-cells, is promising. Indeed, monocytes and neutrophils support phage functions, while lymphocytes are involved in specific immunologic reactions that are rigidly distributed among the various populations of these cells. Along with evaluating the immunologic homeostasis, also helpful is the parallel investigation of the erythron, since erythrocytes, according to current opinions, regulate lymphocyte reproduction and antibody synthesis. When evaluating shifts in blood cells in children, it is helpful to compare the latter with statistical medical indexes. The fact that

the connection between immunity, morbidity, and mortality indexes is rather clear can be assumed based on the role of immunologic mechanisms itself. These mechanisms help prevent infection in the body, control growth, tissue differentiation and structural integrity, and have an anti-tumor effect.

We studied the erythrocyte count, hemoglobin level, color index, indexes of the expanded leukogram (also tested for levels of T-, B-, and O- lymphocytes, and poorly differentiated B-cells), and the levels of M, A, and G immunoglobulins and circulating immune complexes in the blood sera of 82 children aged 1-3 and 7-12 years living in the Arals. These data were compared with similar data on 41 children in the respective age groups who resided outside the ecological disaster area and were examined during the same season of the same year. The research was performed in Kazalinsk and the Kazalinsk collective farm, which is 65 km from the city and 35 km from Leninsk.

We first need to note the rising frequency of congenital deformities (4.8/1000 in 1985, 6.5/1000 in 1990) and the frequent detection of malignant tumors, which is 3.3 times higher among children in the Arals than in Kazakhstan (per 100,000). Mortality due to malignant tumors among adults is first in the Arals, while in Kazakhstan it ranks second.

The birth rate in this region for 1990 is 55 percent higher than the average republic index (33.8 as opposed to 21.8 per 1000).

The number of pyo-inflammatory diseases of the skin in newborns exceeded the average republic index by 17 times (34.7 per 1000 born as opposed to 2.0). In the late neonatal period, respiratory organ disease (21.5) occupied first place in the structure of causes of morbidity. One child in five (average) had pneumonia (4.8 per 1000). Vesicular diseases (6.5) were in second place, acute intestinal infections (3.6) were in third, and omphalitis (2.4) was in fourth place.

At the Kazalinsk collective farm, skin abscesses in newborns exceeded the average index for the region by 15 times (12 per 1000 as opposed to 0.8); omphalitis diseases were ten-fold more common (24 as opposed to 2.4), and vesicular diseases were 3.7 times more frequent (24.1 as opposed to 6.5).

Among preschoolers, the primary cause of morbidity in Kazalinsk was infectious and parasitic diseases (183.5 per 1000). Respiratory organ diseases (110.9) ranked second, and digestive organ pathology held third place.

The frequency of ear infections in schoolchildren at the Kazalinsk collective farm was 5.4 times higher than the average republic index (35 as opposed to 6.5). Abscesses were four times more frequent (2 as opposed to 0.5), and the chicken pox incidence was three-fold higher (15 as opposed to 5.2).



In 1990 infant mortality in Kazalinsk Rayon rose above the average republic index (30 as opposed to 26.3). It did not significantly differ from the index for the oblast (31.9 per 1000). In the structure of causes of infant mortality in this oblast, respiratory organ diseases continue to hold first place, while they rank second for Kazakhstan.

Anemia was diagnosed in 46 of 60 children screened in the one through three year old and seven through 12 year old age groups. In the first group cases of moderate to severe anemia were found three times more often (in the first group, four cases in 14, and in the second group three in 32). Anemia in 39 out of the 46 patients was normal or hyperchromic.

With respect to white blood we noted leukopenia and neutropenia, which was accompanied by relative lymphocytosis. The leukocyte count in the blood was 2.3-2.4 times lower than that of children in the control group, and at the Kazalinsk collective farm, the count was 2.7 times lower. At the same time we found relative and absolute T- and B-lymphopenia in the children. It was especially pronounced in the children at the Kazalinsk collective farm. In the 1-3 year age group B-lymphopenia occurred against a background of a decrease in the number of poorly differentiated B-cells and a decrease in the concentration of circulating immune complexes in the blood. In schoolchildren the latter two indexes did not differ from the control group.

Among the changes in the immunoglobulin level, a decrease in the IgG level was noted most frequently. In children aged two-three years the concentration of IgA did not change, and the IgM level was even elevated. By age 7-12 years the IgA level had dropped and the IgM level was normal. At the Kazalinsk collective farm, the decrease in IgG in preschool children was more pronounced. It was accompanied by a decrease in the IgA level.

Thus, the various disturbances in the T- and B-systems of immunity, which are especially pronounced the closer one draws to Leninsk, were combined with high morbidity in children (inflammatory nature) and an increasing frequency of malignant tumors. In other words, immunologic investigations confirm the low capabilities of the body to adapt at the cellular level, which can be assumed based on the simplest hematologic investigation. These investigations were used to detect leukopenia and relative lymphocytosis, signs of the so-called "overactivation" stage. Anemia, which was found in  $\frac{3}{4}$  of those screened, contributed to inhibition of the immunity reaction in the children screened to a known measure. Humoral immunity was depressed in toddlers to a greater degree than schoolchildren, as suggested by the decrease in the level of poorly differentiated B-cells and circulating immune complexes in the blood that was found in the younger children.

The decrease in the IgA level in the blood can be viewed as a sign of sluggishly proceeding chronic inflammatory processes of the mucous respiratory tracts in the body

with decreased reactivity when air with toxic chemical anthropogenic substances is inhaled. This immunologic shift in many ways explains the high specific weight of respiratory organ diseases in children living in the Arals.

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### Ecological and Medical Aspects of Kazakhstan's Arid Zones

937C0027B Alma-Ata ZDRAVOOKHRANENIYE  
KAZAKHSTANA in Russian No 3, Mar 92 pp 9-10

[Article by T. S. Dzhasybayeva, Infectious Diseases Department, Alma-Ata Medical Institute; UDC 574+616-036.22(574.213.52)]

[Text] The environment has a significant role among the factors comprising the basic indexes of public health, especially general infection morbidity, life span, and infant and general mortality. The ecological situation is gradually deteriorating, and in some areas it has reached catastrophic levels for a number of reasons, which include the intensification of agriculture and the introduction of new methods and technology. The catastrophic areas are Dzhambul, Chimkent, and Dzhezkazgan Oblasts, and Ekibastuz and Alma-Ata, where peculiar technogenic biogeochemical provinces have formed. The most significant is the problem of the Semipalatinsk Nuclear Test Site and the aridization of the Arals, which has had an international effect.

Intensive dehydration of the Aral and powerful processes of aridization have made the existence of man there border on catastrophe. Although some work for life support in the Aral is being done, many problems, including the status of infection and parasite morbidity, require further study and scientific comprehension. In connection with this, we studied by means of expeditions the role of harmful environmental and socioeconomic factors on the distribution of diseases and the effect of the latter on basic public health indexes. In our research we compared the basic indexes of infection morbidity in Kazakhstan for the past 20 years.

The ecological situation in the arid zones of the Arals has developed as a result of atmospheric pollution, the depletion of ground and underground waters, natural resources, degradation and accelerated soil erosion, deflation and secondary salinization of the soil and ground, and pollution of the reservoirs, including rivers and lakes. Ecological stress is exacerbated by a sharp decrease in the socioeconomic and cultural levels of the public and the low education qualification of the people, which combine to form a high inherited burden, and a high frequency of mothers with extragenital pathology with a high birth rate (from 26.1 to 32.2 per 1000 people).

Harmful environmental factors of the arid zones against a background of widespread helminthiasis and by virtue of the development of microstructural processes at the cell-organ level on the part of organs, and especially

those subjected to the greatest functional load (gastrointestinal tract, hepatobiliary system, hemopoietic organs, and the immune system), form disinhibition of immune homeostasis and govern the development of immunopathological reactions that occur in three stages of secondary immunological failure: adaptation stage (stage I), compensation stage (II), and decompensation stage (III). The first stage has no clinical signs and can be diagnosed in the laboratory by changes in the immune status. The second stage is characterized by the clinics of an infection syndrome; the third stage is diagnosed by the combined course of several syndromes, most often infection syndrome with an allergic syndrome and chronic concomitant diseases syndrome.

The degree of the effect of environmental factors in the arid zones decreases in the following order with respect to intensification of the effect on the formation of different groups of diseases: infectious and parasitic diseases, hepatobiliary system diseases, respiratory organ diseases, digestive organ diseases, and endocrine system diseases. A typical aspect of the clinical course of infectious and somatic diseases in the arid zones is the "lag effect" of seeking medical care—due to an effaced beginning and torpid course of the pathological process with a high coefficient of time.

Among the reasons for mortality in Kazakhstan (ratio of men/women per 100,000), the highest indexes are as follows: infectious diseases (42/19 with a union index of 29/14), respiratory organ diseases (171/78 with a union index of 138/61), digestive organ diseases (52/29 with a union index of 47/23), and tumors (291/142 with a union index of 272/130). In Kazakhstan as a whole infectious diseases account for 14 percent of all deaths (with a union index of 2.5 percent), while respiratory organ diseases account for 13 percent of all deaths (with a union index of nine percent).

Among infectious diseases, the cause of death in 55 percent of cases can be attributed to respiratory organ diseases, 17 percent are due to viral hepatitis, 12 percent are due to specific infections, 10 percent are due to acute intestinal infections, 20 percent are due to meningococcal infection, and 0.7 percent are due to typhoid.

In the arid zones of Kazakhstan mortality due to infectious diseases in the Kzyl-Orda Oblast was 59.1 per 100,000, while in Dzhambul and Chimkent these figures were 27.4 and 92.8, respectively, with an average index of 28.5 for the republic.

The make-up of infectious diseases in Kazakhstan is as follows: acute respiratory viral infections (83.1-89.0 percent of all morbidity), intestinal infections (15.3-6.1 percent), childhood infections (1.5-3.9 percent), and zoonoses (0.08-0.06 percent). The specific weight of financial expenditures on infectious diseases is as follows: acute respiratory viral infections, 79 percent; viral hepatitis, 15 percent; acute intestinal infection, 2 percent; measles, 2 percent; parotitis, 0.5 percent; brucellosis, 0.4 percent; and scarlet fever, 0.2 percent.

In the arid zones of Kazakhstan, the role of infectious diseases is more significant in the general structure of human diseases: 20.6 percent of Kazakhstan's population lives within the three ecologically poor oblasts. These areas experience 58.1 percent of the indexes of high morbidity for typhoid, viral hepatitis, dysentery, other acute intestinal infections, salmonella, brucellosis, measles, and rickets.

Morbidity with acute respiratory viral infections in Kazakhstan has increased two-fold during the past 20 years (from 7.3 in 1968 to 14.5 in 1990, per 100,000) with a comparatively stable index for influenza morbidity (1.7 in 1968, 2.7 in 1990). The differences in the acute respiratory viral infection/influenza ratio are significant: from 1.5:1 in the southern cities, including the arid zones, to 9.5:1 in the northern and central zones.

Acute respiratory viral infection morbidity has increased against a background of a sharp decrease in the spread of droplet-spread infections: measles from 743 in 1968 to 1.6 per 100,000 in 1990, diphtheria from 32 to 2.4, respectively.

The dynamics of droplet infection morbidity in the arid zones of Kazakhstan as a whole have not changed; during the past 20 years morbidity with acute intestinal infections has decreased two-fold, while dysentery infections have decreased 2.6-fold. The ratio of bacteriologically confirmed and nonconfirmed forms is 1:2.

In the arid zones of Kazakhstan diseases with a fecal-oral means of transmission dominate in the structure of infectious diseases. Morbidity with typhoid exceeds the average republic index by several times: in the "epicenter" of aridization this index was 19 in 1973, 70 in 1978, and 270 in 1983. In 1988 it was 176 per 100,000 with an average republic index of 4.6 in 1988.

Morbidity with viral hepatitis during the past 20 years has increased 2.6 times, with hepatitis B showing a 1.9-fold increase. In the general structure of patients, 92.5 percent had hepatitis A, 6.6 percent had hepatitis B, and 0.9 percent had hepatitis that was neither A nor B.

The arid zones of Kazakhstan are zones highly endemic for viral hepatitis B. In these zones the morbidity index in 1973 was 394, in 1978 it was 4789, in 1983 it was 690, and in 1990 it was 379 per 100,000. In addition, the infection rate with hepatitis B reached 32.7 percent, including chronic carriage of HB<sub>s</sub>Ag of 19.1 percent and anti HBc was found in 18.2 percent. Among those suffering from chronic hepatitis, 74 percent were found to have the hepatitis B markers, including 34 percent with HB<sub>s</sub>Ag, 68 percent with anti HBc, and 26 percent with both HB<sub>s</sub>Ag and anti HBc.

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### Heavy Metals in Aquatic Macrophytes in Northern Latvian Rivers and Lakes

937C0039A Riga LATVIJAS ZINATNU AKADEMIJAS VESTIS in English No 5, May 92 (manuscript received 15 Mar 92) pp 54-56

[Article by M. Klavins, A. Urtans and U. Cinis, Institute of Biology, Latvian Academy of Sciences, Riga]

[Abstract] Heavy metal levels in the yellow water lily *Nuphar lutea* in the North Vidzeme National Park, a region that is relatively pollution-free, were monitored in July 10-30, 1990. The results showed that concentrations of Pb, Cu, Cd, Co, Ni and Zn (4.33-30.45 µg/g dry matter) in *N. lutea* were significantly higher than the water levels and sediment concentrations (0.05-7.28 µg/g dry wt.). In general, highest concentrations were encountered in Salaca River and Burtnieku Lake, and lowest in Lielupe River and Lodes and Asteres lakes. Although statistically significant correlations between Pb and Cu sediment levels and plant bioaccumulation were lacking, the obvious route of metal ingress rests on rhizome uptake. Figures 1; tables 3; references 14: 1 Russian, 13 Western.

### Trace Metal Complexation in Latvian Aquatic Systems

937C0039B Riga LATVIJAS ZINATNU AKADEMIJAS VESTIS in English No 5, May 92 (manuscript received 15 Mar 92) pp 57-60

[Article by M. Klavins and U. Cinis, Institute of Biology, Latvian Academy of Sciences, Riga]

[Abstract] Inland Latvian waters which are generally rich in inorganic substances were analyzed for complexation of Cu(II), Pb(II) and Cd(II) in 1989-1990. The resultant data from 12 sampling sites revealed that complexation of Pb(II) is three to ten times greater than that of Cu(II) and more than ten-fold greater than that of Cd(II). Correlation analyses further demonstrated that complexation of Pb(II) and Cu(II) is due largely to organic substance and inorganic ions, while complexation of Cd(II) depends largely on water levels of inorganic ions. Figures 2; tables 4; references 14: 1 Russian, 13 Western.

### Environmental Aspects of CFC Use in Production of Rigid Polyurethane Foams

937C0039C Riga LATVIJAS ZINATNU AKADEMIJAS VESTIS in Russian No 5, May 92 (manuscript received 12 Feb 92) pp 61-67

[Article by U.K. Stirna, P.I. Solodovnik and V.A. Yakushin, Institute of Wood Chemistry, Latvian Academy of Sciences]

[Abstract] Ozone depletion—as a result of CFC use as blowing agents in the production of rigid polyurethane foams, including spray foams—has resulted in a worldwide search for acceptable substitutes. Two of the more promising substitutes for trichloromethane (freon-11) have been identified as the hydrofluoroalkanes freon-123 and freon-141v, and for dichlorodifluoromethane (freon-12) freon-22 has been proposed as the most promising substitute. In addition, carbon dioxide and a variety of  $C_nH_bF_c-O-C_dH_eF_f$  ethers have been shown to produce foams with acceptable

properties. In the Baltic states and other former Soviet republics a number of polyols have been found effective in reducing freon-11 concentrations to 3.0-3.6 percent, much lower than the levels (5.7-9.5 percent) attained by some Western firms. Figures 2; tables 5; references 31: 2 Russian, 29 Western.

### Pressing Problems in Sanitary Control of Water Resources and Soil

937C0063A Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 91 pp 6-9

[Article by O. I. Voloshchenko, V. A. Prokopov, G. Ya. Chegrinets and I. V. Mudryy, Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev, Republic Scientific Hygienic Center, UkSSR Ministry of Health, Kiev; UDC 614.776/777 (477)]

[Text] Sanitary control of water resources and supply of high-quality drinking water to the population were objects of adequate attention in the republic in 1986-1990. Water quality was improved or at least stabilized in certain areas of fresh-water basins by implementing a complex of organizational, scientific, and practical measures to control water pollution.

However, in some regions of the republic the water of surface water basins continues to be polluted in many areas by insufficiently treated and untreated municipal, industrial, and agricultural liquid wastes; by drain water from hydrotechnical land improvement systems; and by surface runoff from city territory and agricultural land.

The principal impurities with concentrations exceeding the PDKs [maximum permissible concentrations] in the Dniepr, Northern Donets, Southern Bug and Dnestr river basins are petroleum products, organic and biogenic substances, salts of heavy metals, and phenols. Many of the republic's small rivers are in an unsatisfactory ecological and hygienic state.

Analysis of materials from research conducted in the UkSSR indicates that not only small rivers but also large fresh-water basins are continuing to be polluted. The greatest pollution is observed in the Dneprodzerzhinsk and Dnepropetrovsk sections of the Dniepr River; the Northern Donets River in the vicinity of Severodonetsk, Lisichansk, and Rubezhnyy; and the Southern Bug River in the vicinity of Vinnitsa and Pervomaysk.

A special danger to water use arises at the time of discharge from holding ponds still being used by a number of the republic's chemical enterprises (the Rubezhnyy Integrated Chemical Works, the Donsoda and Slavsoda plants, and the Stebnik Integrated Chemical Works) and at times of accidents. For example many kilometers of the Dnestr River transformed into a lifeless ditch as a result of an accident at the holding pond of the Stebnik Integrated Chemical Works; accidents occurred with holding ponds of sugar plants; a one-time discharge of wastes containing a high sulfanol concentration from the Vinnitsa Chemical Plant was recorded; and so on.

A study of the status of the problem of protecting waters of the republic's seacoast shows that despite the measures being implemented, contamination of these waters is not decreasing and the level of chemical and microbial contamination of water of the coastal strip continues to remain high. The sanitary condition of the coastal strip of the Black Sea in Kherson, Nikolayev, Odessa, and Crimean oblasts raises special concern.

A complex and dangerous situation has evolved in connection with pollution of Dzharylhagskiy Bay in the vicinity of the currently developing Skadovsk health care zone. Around 220 million m<sup>3</sup> of drainage and irrigation water are discharged annually by canals into the bay in this region, leading not only to freshening of the bay (the salt content is down to 2 gm/liter, as compared to 19-20 gm/liter in the open sea), but also to siltation of its bottom and contamination of the water by organic matter, toxic chemicals, and mineral fertilizers.

Research conducted in 1986-1988 established that several pesticides in the water of the bay exceed the PDK. They have also been detected in silt, algae, jellyfish, and fish. Besides pesticides, a large quantity of phenols (up to 16 times the PDK on the average) are detected in waters of Dzharylhagskiy Bay, and surfactants are detected in the surface layer (from 3 to 8 times the PDK).

The observation materials indicate significant pollution of the coastal strip of the Black Sea in the vicinity of Odessa. Entry of insufficiently treated municipal, domestic, and industrial liquid wastes into the sea is leading to chemical and especially bacterial contamination of water at beaches and within the seaport. Because of contamination of the coastal strip, public health and epidemiological services have often been compelled to close beaches in the Odessa vicinity in recent years.

Observations of recent years indicate that the coastal strips by the Yalta resort and near many other coastal Crimean population centers are in poor sanitary condition, chiefly because of discharge of insufficiently treated liquid wastes and entry of runoff into the sea. The quality of sea water in the vicinity of Bolshaya Yalta fails to meet the hygienic requirements imposed on aquatic recreation zones. In 1989 the public health and epidemiological service of Crimean Oblast closed a number of beaches of Bolshaya Yalta, Alushta, Feodosiya, and Yevpatoriya due to bacterial contamination of sea water.

Discharge of liquid wastes into the Sea of Azov has an even greater negative influence. This is especially noticeable in the vicinity of Mariupol, where industrial liquid wastes are discharged into coastal waters from two giant integrated iron-and-steel works possessing by-product coke industry—Azovstal and imeni Ilich. The discharges of liquid wastes result in significant contamination of the coastal strip of the sea, change in the physicochemical and biological properties of the sea water, decrease in its transparency, and profuse deposition of silt at the coast.

According to data from research conducted in 1988, the quality of river water failed to meet hygienic standards

in 20.7 percent of analyzed samples with respect to chemical indicators and 27.5 percent of samples with respect to biological indicators. For sea water, the quantities of such samples were 27.7 and 40.6 percent respectively.

This five-year plan, the republic's scientific and practical institutions did a great deal of work in laboratory control of the quality of river and sea water and in inspection of the fulfillment of water protection measures such as building and rebuilding treatment plants decontaminating different types of liquid wastes, erecting water recycling systems for industrial water supply to enterprises, and so on. The priority and future water protection measures directed at ensuring that the republic's water resources would be maintained in a favorable sanitary and ecological state were determined on the basis of the results of this work. Such a state may be achieved through sensible use of water resources, introduction of recycled water supply and recycling of liquid wastes, creation of industrial water pipelines in order to economize on pure water, recycling of valuable components in liquid wastes using different methods of their treatment—biological, electrochemical, ion-exchange, and use of liquid wastes to irrigate agricultural fields.

The soil of today's population centers and agricultural land is exposed to the effects of factors of varying intensity and significance associated with the industrial and day-to-day activities of people.

In this time of intensive industrial influence upon the environment, we can isolate a number of the leading causes of change in the structure and chemical composition of soil evoking the risk of "chemical diseases" in certain groups of people or of the populations of entire regions:

- gas and dust releases of industrial enterprises and power production facilities into the atmosphere; accumulators of liquid and solid industrial wastes of production operations;
- cultivation of agricultural crops on the basis of intensive farming practices (use of high doses of mineral and organic fertilizers and a complex of chemical plant protection resources);
- other forms of activity—open-pit mining of minerals, transportation exhausts, irrigation by river water and waste water, and so on.

For example, the density of manganese fallout over the territory of the Mariupol Azovstal Iron-and-Steel Works is 76.6 kg/ha, 5 km away it is 15.3 kg/ha, and within a radius of 20 km it is 0.6 kg/ha per year. If we adopt the last figure as a control value characterizing the quantity of manganese settling on soil as a result of global atmospheric transport of chemical contaminants, then the control was exceeded by a factor of 127 on plant territory and by a factor of 25 at a distance of 5 km from the enterprise. This factor was correspondingly 42 and 34 for chromium and 7 and 5 for zinc.

The yield of blast-furnace slag is very large, being from 0.4 to 0.65 tons per ton of cast iron, which is equivalent to tens of millions of tons per year when expressed in relation to the total quantity of ferrous metals smelted in the republic.

The coal enterprises of the UkSSR possess around 1,300 rock dumps, the total volume of which is at around 1,483,000,000 m<sup>3</sup>. All of these wastes contain sulfuric compounds, heavy metals, phenols and hydrocarbons that pollute the soil not only in health protection zones but also beyond them.

Around 25 percent of all industrial wastes are not salvaged in the national economy. They are burned; they are transported to industrial and municipal dumps; and they often contaminate the soil, water basins, and the air with toxic ingredients. The wastes of galvanic production operations containing the salts of heavy metals present a special danger in relation to environmental contamination.

The results of an investigation of domestic and industrial waste decontamination sites in the republic show that a large number of the locations do not correspond to standards presently in effect. Of the more than 5,000 dumps in the UkSSR, just the Ministry of Housing and Municipal Services alone operates 700 of them (14 percent). Among them, 34 percent are potential sources of soil contamination, 28 percent are potential sources of ground water contamination, and 23 percent are potential sources of contamination of surface water basins.

Ash particles stirred into the air during handling of the wastes of thermal and electric power plants present a serious danger to the biosphere, because radioactive isotopes of the uranium-radium and thallium series remain in ash after coal is burned.

If we compare the volume of the effort to increase soil fertility in the UkSSR over the past 20 years, we would find that the average annual quantity of mineral fertilizers applied in the period from 1981 to 1985 increased by a factor of 3.3 in comparison with the quantity in 1961-1965 (correspondingly 117 and 36 kg/ha with respect to the active ingredient). The quantity of organic fertilizers applied during this period doubled (from 3.9 to 7.8 tons per hectare of plowed land).

Concurrently with growth of the yields of most agricultural crops, a significant increase in the concentration of nitrates (nitrosoamine precursors) in these crops has been observed in recent years: by a factor of 5-6 in potatoes, 5 in cabbage and 3 in cucumbers. Depending on the soil and climatic conditions and numerous other factors (species composition, variety, age of agricultural crops), daily uptake of nitrates by the human body experiences wide fluctuations (from 40 to 800 mg), which makes it very difficult to evaluate their influence on health.

Toxicological and hygienic research conducted in our country in the last 20-25 years made it possible to

improve the overall hygienic characteristics of the assortment of pesticides presently employed. The use of 120 preparations was prohibited or sharply limited on the basis of the research results, which led to a nine time decrease in the mean-weighted indicators of acute toxicity (in comparison with 1960) for insecticides, a four time decrease for fungicides and a 2.2 time decrease for herbicides. At the same time, the danger of chronic intoxications associated with circulation of pesticides in objects within the biosphere still exists. The danger of the negative effects of pesticides on the health of the population increases in regions in which their load exceeds the union average (2-3 kg/ha) by five or more times (Crimean and Odessa oblasts).

Surfactants are contained in practically all industrial and domestic liquid wastes of every population center in connection with wide use of detergents in different sectors of the national economy and at home. When liquid wastes are subjected to treatment, 10 percent of the contaminants, which are the most resistant and which yield to oxidation the slowest as a rule, including surfactants, enter the environment. The concentration of anionic surfactants in waste water intended to be used for irrigation purposes varies in a number of the republic's irrigation systems by an average of from 0.2 to 3 mg/liter. In this case the quantity of surfactants in the plowed layer of soil may attain 10 mg/kg. Heavy metals are also a permanent ingredient of liquid wastes. Accumulation of a number of metals in soil can inhibit the activity of soil microflora, which carry out the highly important processes of soil self-purification and nitrogen fixation, influence the resistance of plants to diseases, and decrease their food value. The influence of surfactants on the behavior of heavy metals and nitrates in soil and on their translocation in plants has not been clarified adequately.

Research carried out in the republic has established the presence of dependable correlations between the territorial load of pesticides and population morbidity.

The especially high sensitivity of children in their first year of life to the effects of pesticides (due to insufficient development of the systems that detoxify xenobiotics) creates the need for radically changing the organization of infant nutrition, for introducing pesticide-free procedures for producing the raw materials for children's food, stiffening the requirements in the all-union state standards regarding the permissible concentrations of chemical compounds in raw materials, and reviewing existing regulations on residual quantities of pesticides in food products with regard for ensuring the safety of the youngest population group, and so on<sup>1</sup>.

Even if we limit ourselves to just the facts presented here, it becomes obvious that in order to objectively evaluate and predict the consequences suffered by the health of the population from the chemical anthropogenic loads imposed upon the environment as a whole and upon the soil in particular, we would have to examine not the effect of each factor taken separately,

but their integral influence. This is why data on the correlation between the advent of a number of intoxications and total introduction of fertilizers, pesticides, and other toxic substances into the environment are being published more and more often in recent years throughout the entire world<sup>2</sup>.

The indicated problems can be solved only on the condition that scientific and technical progress orients itself on the requirements of social hygiene and proceeds on the basis of the territorial principle of controlling natural complexes. This would require measures of the following sort:

- dynamic study and evaluation of the ecological and hygienic situation on the scale of the republic and individual regions posing an elevated risk to the health of the population;
- differentiation of these territories with respect to the nature of degradation and sources of danger to the biosphere as a whole and to the health of the population in particular;
- introduction of low-waste and wasteless production lines that would preclude contamination of the soil and other environments at enterprises of different industrial sectors;
- development of a package of measures to restore natural complexes, including measures to strengthen the health of the population.

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#### Virus Collection Stolen From Sukhumi Laboratory

937P0033A Moscow KOMSOMOLSKAYA PRAVDA  
in Russian 23 October 92 p 4

[Article by EL MUNDO (Spain) correspondent D. Polikarpov, special to KOMSOMOLSKAYA PRAVDA, Sukhumi: "What Monkey Can Stand up to a Guardsman With A Machine Gun?"]

[Text]

#### Famous Sukhumi Nursery Robbed. Plague and Cholera Viruses [sic] Stolen.

A guardsman with a "Kalashnikov" in his hands, stood leaning against a tree and looked toward the mountains where the front lies. On his shoulder sat a small, thin monkey. The little beast's eyes were frightened and sad. On the way back to town, our "chauffeur"—a well-known Sukhumi doctor, said, without turning his head,

"A little monkey from the nursery. Previously the guardsmen had a lot of them, but they all died: there was nothing to feed them."

Sukhumi residents always had reason to be proud of their city. But it contained two objects of note which no self-respecting tourist could fail to acquaint himself with: the botanical garden and the monkey nursery.

Scientists of many countries knew of the latter's existence—it was there that the first monkeys to fly in space were trained. But what was of interest to science was not so much the planet's largest colony of what, according to some information, are our closest relatives, as the USSR Academy of Medical Sciences Institute of Experimental Pathology and Therapy, which operated on the base of the nursery and which was without analogue.

The institute, which had a very rich collection of viruses, studied the characteristics of their effect on the living organism. More specifically, on monkeys. In some laboratories, as the result of numerous experiments and observations, the rarest medicinal preparations were created and approved. There existed a department which studied oncological diseases and conducted a search—claimed to be successful—for a vaccine against AIDS. Several of the institute's employees claim that people from the Russian Military Biological Laboratory worked in the vicinity, in a civilian building. Apparently it [the Russian Military Biological Laboratory] was successfully evacuated.

Today in Sukhumi time is divided into "before the war" and "after." Before the war they wanted to build the world's first monument to the monkey here. Before the war they were planning to cut the staff. Now there is no one to dismiss: The Sukhumi monkey nursery no longer exists, neither the people nor the monkeys.

"The guardsmen came here in the first days of the war," recounts the institute's translator, who asked not to be named. "They lugged off everything that could be carried. When nothing was left, they began to take the monkeys with them. People tried to explain to them that many animals were infected and as a result would die in their possession. Then the guardsmen began to shoot the monkeys right in the cages.."

Most of the institute's employees were successfully evacuated. Their director, academician Boris Lapin, didn't suffer either. As early as 1989, when the first signs of the coming conflict appeared, he began to create a branch in Russia. The First Institute of Medical Primatology in Adler [city located on the Black Sea, south of Sochi, in Krasnodar Krai, Russia] now continues part of the experiments begun in the Sukhumi Center. But, as Lapin himself thinks, to make up for what was stolen from the nursery would take at least several years.

The marauders carried off all the latest electronics and tore up the documentation. Of the institute building, only the walls remain. Of the three thousand monkeys that lived in the nursery, now fewer than half are left.

Even during the shootings some employees who had remained in the city went to the institute and tried to save the lives of their charges. But soon it became hard to find a crust of bread even for a human in Sukhumi.

The monkeys proved to be less hardy than the people. They did not know what hunger was and quietly died in their cages. Their former "comrades" were carried off by Georgian soldiers as trophies. They say that on the Tblisi market the asking price for one monkey from the nursery was 25,000 rubles.

But the worst was yet to come. On one of the nights after the armed men's next visit, the collection of viruses disappeared from the laboratory. According to the specialists' estimate, if some of them were to get into the city's water system, they could cause an epidemic of such diseases as plague or cholera. Of greatest concern, of course, is the work of the military laboratory. It is possible that not everything was evacuated, and since no one knows what the military doctors were studying, it is impossible to evaluate the degree of risk. Only one thing is clear: It is possible that someone, without suspecting it himself, holds in his hands the lives of many thousands of people.

#### **Officials Note Worsening Environmental Situation; Birthrate Decline**

*OW0810130892 Moscow INTERFAX in English  
1101 GMT 8 Oct 92*

[Following item transmitted via KYODO]

[Text] Data related to the state of the nation's health as well as the environment in Russia in 1991 are worrisome. This was indicated by the Moscow news conference on Wednesday [7 October] held by the presidential advisor on environmental problems Aleksey Yablokov, the Minister for Natural Resources Viktor Danilov-Danilyan, the Chairman of the State Committee for Sanitation Yevgeniy Belyayev and the President of the Academy of Medical Sciences Valentin Pokrovskiy.

The rate of population growth continues to shrink. While between 1980 and 1988 the population grew by about one million a year, in 1991 the figure dropped to 200,000. While the birth rate has been falling, the death rate has been growing. In 1991 the birth rate per one thousand of the population was 12.1 and the death rate 11.4. The number of territories where the death rate exceeds the birth rate grew from 10 in 1989 to 29 in

1991. The average life span has remained practically unchanged: 64 years for men and 74 for women.

By May 1, 1992 Russia had registered 558 AIDS-carriers, 81 of them diagnosed patients. 51 persons died of the fatal disease. 31 percent of the sick are children.

The environmental situation is also worsening. Only 15 percent of urban dwellers live in territories with pollution below the permitted norms. Almost half of the drinking water does not meet hygienic requirements. The annual dumping of polluted water increased from 15 bn [billion] cubic meters in 1985 to 28 bn in 1991.

In 1991 in 84 cities with a combined population of 50 mn [million] air pollution exceeding the norm 10 times and more was registered many times.

#### **Russia: Pollution in Vladimir Causes Tumors in Infants**

*PM0710131992 Moscow Russian Television Network  
in Russian 1100 GMT 4 Oct 92*

[From the "Vesti" newscast: Video report by S. Muravkin and V. Yevstigneyev, identified by caption, from Vladimir; figures in brackets denote broadcast time in GMT in hours, minutes, and seconds]

[Text] [111018] [Muravkin over video of a backwater] Even professionals who had seen a thing or two, gasped at the figures announced by Russian experts a few days ago at the Vladimir City Soviet. The maximum limits of certain metals alone present in effluent have been exceeded 580-fold. Yes, 580-fold, you have not misheard. As a consequence, the incidence of asthma, pneumonia, and diabetes has increased by 300 percent in the city.

In the case of adults it may still be possible to argue that this is due to harmful working environments and bad habits. But the three-fold increase of malignant tumors among children is a direct result of environmental pollution.

There has also been an incredible expansion of industrial zones. They now occupy 40 instead of the prescribed 5 percent of territory. Even springs—the city dwellers' pride and joy—are no longer safe. Water from these springs can be drunk only after it has been boiled.

What are the deputies doing about this? Instead of adopting emergency measures, they have decided to proceed with the work of the public expert inquiry in order to establish to what extent it is dangerous to live in the city, and what else can be done to prevent the city from being declared an ecological disaster zone. [111113] [video shows backwater, baby in incubator, industrial installations, a spring, a street scene]



**Course of Influenza A Epidemics in Kazakhstan**

937C0027C Alma-Ata ZDRAVOOKHRANENIYE  
KAZAKHSTANA in Russian No 3, Mar 92 pp 11-12

[Article by A. T. Ismagulov, A. G. Nazhmedenova, and L. K. Berdybekov, Epidemiology, Microbiology, and Infectious Diseases Scientific Research Institute, Alma-Ata; UDC 616.921.5-036.22(574)]

[Text] The current strains of influenza virus A, A(H1N1) and A(H3N2), have been leading in recent years in the etiology of diseases of acute respiratory viral infections.

In the beginning of January 1989 (2 January-8 January), an influenza epidemic caused by virus A(H1N1) was found in Karaganda and Dzhambul, and a week later in Chimkent. It gradually spread further to encompass five more cities within that month (Alma-Ata, Pavlodar, Dzhezkazgan, Kzyl-Orda, and Uralsk). Then the epidemic process spread to other cities in the region, and the influenza epidemic lasted until April. It lasted longest in Karaganda and Dzhezkazgan (10-11 weeks). The epidemic peaked in the cities an average of three weeks from the beginning of the epidemic, with the exception of Karaganda, where it peaked in the eighth week. The average duration of the epidemic for all cities in Kazakhstan was 7.2 (6.1-8.3) weeks.

Influenza morbidity averaged 4.6 (3.9-5.3) percent for the 17 oblast centers of Kazakhstan (Table 1).

**Characteristics of Influenza A(H1N1) Epidemic in 1989 for Kazakhstan**

City	Period of epidemic in weeks of the year				Influenza morbidity (%)					Specific weight of influenza in annual morbidity
	Beginning	Peak	End	Duration	0-2 years	3-6 years	7-14 years	15+ years	Entire populace	
Alma-Ata	5	3	11	7	0.0	12.8	17.3	1.1	4.2	10.0
Akt'yubinsk	7	3	12	6	1.8	20.2	11.8	0.2	1.6	5.5
Guryev	—	—	—	—	0.0	0.0	0.6	0.0	0.0	—
Dzhambul	2	3	8	7	15.8	13.4	8.8	1.0	4.3	18.1
Dzhezkazgan	4	4	13	10	11.2	22.9	12.4	0.6	4.5	18.8
Karaganda	2	8	12	11	3.4	16.8	13.6	2.4	8.3	22.9
Kzyl-Orda	5	3	9	5	0.5	5.9	1.7	0.2	0.8	9.0
Kokchetav	6	3	12	7	3.6	29.0	23.8	2.9	6.8	18.0
Kustanay	7	5	14	8	12.7	26.7	16.7	3.9	7.8	24.8
Pavlodar	4	2	9	6	18.3	29.8	32.5	2.6	7.6	18.0
Petropavlovsk	6	4	12	7	6.6	23.6	19.5	3.0	6.8	19.2
Semipalatinsk	6	4	12	7	0.0	5.7	2.1	1.4	9.8	33.4
Taldy-Kurgan	8	2	11	4	0.0	0.0	1.7	0.7	0.8	3.7
Uralsk	5	4	12	8	3.9	18.4	21.8	3.3	6.8	26.3
Ust-Kamenogorsk	6	4	13	8	0.0	9.6	8.7	2.4	4.0	11.8
Tselinograd	6	3	13	8	10.8	14.1	11.9	2.1	4.9	24.6
Chimkent	3	3	8	6	0.8	5.3	4.1	0.5	1.8	10.7
Average	5.1	3.6	11.3	7.2	8.1	16.9	12.3	1.8	4.6	17.2
with low and high significant limits	4.4-5.9	3.1-4.1	9.6-12.9	6.1-8.3	6.4-9.8	14.2-19.6	10.6-14.0	1.6-2.0	3.9-5.3	13.0-21.4

It was mainly preschool and school-age children that became ill. In particular, the morbidity among children 0-2 years was 8.1 (6.4-9.8) percent; 3-6 years, 16.9 (14.2-19.6) percent; and 7-14 years, 12.3 (10.6-14.0) percent. The specific weight of "pure" influenza in total morbidity for the year with influenza and other acute respiratory infections was 17.2 (13.0-21.4) percent. This pattern of development for the influenza epidemic is explained by the fact that it was primarily children from organized collectives and schoolchildren, for whom rapid spread of this epidemic is typical, who were involved in the epidemic process.

Next, in 1990 the epidemic surge in influenza A(H3N2) morbidity began in the first week (January 1-7) among 3-6 year old children in Karaganda, Dzhambul, Dzhezkazgan, and Kokchetav, with a 27.1 percent increase in morbidity. Then the epidemic process almost simultaneously encompassed the other oblast centers of Kazakhstan. The duration of the epidemic in the cities ranged from 4 to 9 weeks and was characterized by sluggish and slow development.

In the influenza epidemic being analyzed, morbidity in preschool children (3-6 years) was 10.7 (8.1-13.3) percent, while in schoolchildren aged 7-14 years it was 7.8

(6.2-9.4) percent. At the same time, adults became ill three to five times less often and their morbidity was only 1.4 (0.8-2.0) percent. The specific weight of "pure" influenza in the total annual morbidity with influenza

and acute respiratory infections was 14.3 (12.0-16.3) percent. As with the preceding epidemic, influenza morbidity increased primarily due to preschool and school-age children (Table 2).

**Characteristics of Influenza A(H1N1) Epidemic in 1990 for Kazakhstan**

City	Period of epidemic in weeks of the year				Influenza morbidity (%)					Specific weight of influenza in annual morbidity
	Beginning	Peak	End	Duration	0-2 years	3-6 years	7-14 years	15+ years	Entire populace	
Alma-Ata	2	3	7	6	1.5	11.4	12.4	2.4	4.7	12.2
Aktyubinsk	2	5	8	7	10.7	17.6	11.5	0.5	2.7	10.8
Guryev	4	2	7	4	2.2	0.0	1.7	2.3	2.4	9.3
Dzhambul	1	3	9	9	14.6	8.3	6.4	0.8	3.7	16.4
Dzhezkazgan	1	8	8	8	2.0	9.8	4.6	0.3	1.6	8.8
Karaganda	1	8	9	9	2.3	3.3	3.4	0.1	3.9	13.1
Kzyl-Orda	2	3	9	8	7.1	11.9	5.0	0.5	3.2	24.8
Kokchetav	1	5	9	9	2.1	20.4	11.8	1.0	3.8	12.2
Kustanay	2	4	9	8	3.1	19.2	9.6	2.0	4.9	21.2
Pavlodar	2	5	9	8	7.2	9.5	11.6	1.3	4.1	12.7
Petropavlovsk	2	5	10	9	0.9	9.2	9.3	1.9	3.4	11.5
Semipalatinsk	3	3	9	7	1.0	6.3	5.2	0.2	2.1	8.4
Taldy-Kurgan	3	3	8	6	4.8	6.9	11.3	2.2	4.9	20.9
Uralsk	3	1	10	8	1.5	12.1	12.7	4.2	5.4	15.3
Ust-Kamenogorsk	3	4	9	7	0.2	9.3	8.6	1.4	3.3	10.4
Tselinograd	3	5	9	7	11.1	9.1	5.3	0.6	2.7	15.8
Chimkent	2	2	5	4	6.9	6.8	1.4	1.6	2.8	18.9
Average	2.2	4.1	3.5	7.1	4.7	10.7	7.8	1.4	3.5	14.3
with low and	1.8-	1.2-	1.5-	6.6-	2.7-	8.1-	6.2-	0.8-	3.0-	12.0-
high significant limits	2.6	3.1	2.9	8.0	6.7	13.3	9.4	2.0	4.0	16.3

Thus, in 1989 and 1990, two influenza epidemics caused by virus serotypes A(H1N1) and A(H3N2) were recorded in Kazakhstan. These epidemics were marked by the number of preschool and school-age children affected. However, the total and age-group morbidity varied by city.

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**SPECTAT: Miniset Programs for Statistical Analysis in Population Genetics**

927C0507A Moscow *GENETIKA in Russian* Vol 28 No 3, Mar 92 (manuscript received 05 Apr 91; in final form 17 Jul 91) pp 194-197

[Article by Yu.F. Kartavtsev and A.A. Solovyev, Institutes of Marine Biology and of Problems of Marine Technology, Far Eastern Division, Russian Academy of Sciences, Vladivostok; UDC 57.087.1:575.17]

[Abstract] SPECSTA (SPECial STATistics; 300K) is a miniset of programs written in Turbo Pascal-5 for statistical processing of population genetics data under DOS. The system is capable of analyzing allele frequencies, chi-squares, Hardy-Weinberg data,  $H_O$ ,  $H_s$ ,  $F_{is}$ ,  $F_{st}$ ,  $F_{it}$ ,  $H_t$ , and  $D_{st}$  values. Other parameters managed by SPECSTAT include analysis of Nei genetic distances, Kalabushkin's similarity indices and other factors. The output appears in tabular form suitable for publication. Tables 2; references 13: 1 Russian, 12 Western.



**Epidemiological Use of Modified  
Radioimmunoprecipitation Test for HIV-1  
Antibodies**

937C0018A Moscow IMMUNOLOGIYA in Russian No 1,  
Jan-Feb 92 (manuscript received 28 Jun 91) pp 15-18

[Article by E.V. Karamov, V.A. Lukashov, V.A. Slepishkin, S.A. Chaplinskas, A.P. Gorbacheva and I.A. Rudneva, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Lithuanian Center for AIDS Prevention, Vilnyus; UDC 616.153.96-097:578.828.6]-078.333]

[Abstract] HIV grown in EVK/IRA-3 cell line was used in a modified radioimmunoprecipitation test (MRIT) which was found to be more sensitive and specific than a commercially available immunoblotting (IB) kit (Dupont, USA). The essential features of MRIT consist of incubation of the labeled antigen with test serum overnight at 4°C, addition of protein A-Sepharose, further incubation for one hour at 4°C and eventually electrophoresis in 10 percent SDS polyacrylamide gel. Studies with reference and patient sera demonstrated the greater specificity and sensitivity of MRIT over IB for an entire battery of HIV antigens. The advantage of MRIT appears to be due to the fact that the antigen-antibody reactions proceed in a liquid medium favoring multivalent binding. In addition, the milder reaction conditions of MRIT may be assumed to ensure better preservation of specific epitopes. Figures 2; tables 2; references 7: 4 Russian, 3 Western.

**Cross-Reaction in Radioimmunoprecipitation  
Between HIV-1 and HIV-2**

937C0018B Moscow IMMUNOLOGIYA in Russian No 1,  
Jan-Feb 92 (manuscript received 28 Jun 91) pp 18-20

[Article by V.V. Lukashov, V.A. Slepishkin, A.P. Gorbacheva and E.V. Karamov, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; UDC 616.98:578.828.6]-092:612.017.1.064]-07:616.153.96-097.078.334]

[Abstract] Cross-reaction between HIV-1 and HIV-2 was assessed by radioimmunoprecipitation (RIP) on seven patient sera. The results showed cross reactivity between products of *gag* and *italenv* genes. Accordingly, RIP cannot be used for differentiation between HIV-1 and HIV-2 infections but does ensure detection of HIV-2 infections in studies employing HIV-1 antigens. Furthermore, serum from a rabbit immunized with HIV-1 was shown to react with HIV-2 p68 and gp41 proteins, and serum from a rabbit immunized with HIV-2 crossreacted with HIV-1 gp160, gp120, p68, p55 and gp41 proteins. Consequently, the degree of crossreactivity observed with RIP in the case of clinical samples may well be due to the test's sensitivity—which is greater than that of immunoblotting—rather to superinfection. Figures 1; tables 1; references 10: 3 Russian, 7 Western.

**Zidovudine Immunorehabilitation in Pediatric  
AIDS**

937C0018C Moscow IMMUNOLOGIYA in Russian No 1,  
Jan-Feb 92 (manuscript received 16 May 91) pp 20-23

[Article by L.P. Sizyakina, E.N. Simovyanyan, V.N. Chernyshov, N.M. Kolodyazhnaya and V.B. Denisenko, Rostov Medical Institute, Rostov-on-Don; UDC 616.98:578.828.6]-078.33]

[Abstract] Therapeutic trials were conducted with zidovudine (180 mg/m<sup>2</sup>, five times per 24 hours, one month with two week break; two courses) with or without sodium nucleinate (0.1 g b.i.d., 15 days) in the management of 45 children (3-10 years) in various stages of HIV-1 infection. Clinical observations and laboratory monitoring indicated that zidovudine was effective in early stages of the disease and that its effects were potentiated by sodium nucleinate. Clinical improvement was manifested as attenuation of lymphadenopathy in conjunction with reduction in the size of the spleen and liver and the incidence of opportunistic infections. Sodium nucleinate was implicated in enhanced phagocytic function and preclusion of a further rise in HIV antibody titers. Children in more advanced stages of HIV infection did not benefit from this therapeutic regimen. Figures 4; references 11: 4 Russian, 7 Western.

**Changes in Psychophysiological Characteristics in Visual System With Different Retina and Visual Nerve Pathology in Humans With Low Vision as Result of Transcutaneous Stimulation of Visual Path Periphery**

937C0013B Moscow *SENSORNYE SISTEMY in Russian*  
Vol 6 No 2, Apr-Jun 92 (manuscript received 02 Jul 91)  
pp 67-77

[Article by V. B. Polyanskiy, G. L. Ruderman, Ye. B. Kompaneyets, V. V. Borovkov, T. I. Forofonova, and M. N. Yefimova, Moscow State University imeni M. V. Lomonosov; Rostov State University; Moscow Eye Diseases Scientific Research Institute imeni Gel'mgolets; UDC 612.844+612.822.3]

[Abstract] This paper analyzes changes in the frequency-contrast characteristics of the visual analyzer and visual acuity in 211 subjects (337 eyes) with poor vision both before and after the use of electrical stimulation through the

skin on the periphery of the visual analyzer. An active electrode was placed on the eyelid of a closed eye through which pulses passed at a frequency of 20-30 Hz (1 Hz every 30 sec = cycle; 6-8 cycles used to stimulate one point). The treatment course lasted five to eight sessions. All groups of patients, who suffered from retrobulbar neuritis, anteroischemic neuropathy, arachnoiditis, and cerebrospinal injuries, exhibited improvement in visual contrast sensitivity at almost all space frequencies after the electrical stimulation treatments. The average improvement in visual acuity was 91 percent, but six months after the first stimulation acuity had decreased by an average of 15 percent. A second electrical stimulation course improves visual acuity by an additional 22 percent, for a total average improvement of 107 percent. The authors attribute the improvement in vision to prolonged post-tetanic potentiation that develops in the cerebral visual cortex. Possible mechanisms for this improvement are discussed. Figures 5; tables 1; references 16: 12 Russian, 4 Western.

**New Concepts of Structure and Biogenesis of Intracytoplasmic Membranes of Methane Oxidizing Bacteria *Methylomonas Rubra***

927C0500A Kiev MIKROBIOLOGICHESKIY ZHURNAL in Ukrainian Vol 53 No 5, Sep-Oct 91 (manuscript received 30 Nov 90) pp 3-11

[Article by V. V. Stepanyuk, T. P. Kryshchak, M. I. Kanyuk, Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Kiev; UDC 279.23:279.85:277.352]

[Abstract] New concept have been expressed concerning the structure and possible mechanisms of the genesis of intracytoplasmic membranes (ICM) of the methane oxidizing bacterium *Methylomonas rubra*. Review of negatively contrasted preparations showed that vesicular-disk-like or occasionally tubular ICM emerged from the lysed cells; in 80-90 percent of the cuts they were of the morphologic type I which remained centrally located in the cytoplasm, with no contact with plasmalemma. Accumulation of amorphous (lipoprotein) ICM material occurred in about 10 percent of the cuts. Considerably less ICM material was seen in cells cultivated in methanol medium—only in 30-40 percent of the cuts. However, the accumulations of the amorphous material occurred then in 80-90 percent of the cuts. Inoculation of the methane containing nutrient medium with such cells yielded a population with renewed ICM system but with a decreased amount of the amorphous accumulations. Only single cuts of the lysed cells showed the continuity of ICM and plasmalemma. It was assumed that in the native state the ICM plates are penta-layered. The ICM may reproduce themselves by self-assemblage from the amorphous accumulations of the lipoprotein material or by

replication of the plasmalemma, analogously to the replication on the matrix, rather than by invagination of the plasmalemma, as it was believed to be the case in the past. Figures 2; references 40: 15 Russian (2 by Western authors), 25 Western (1 by Ukrainian author).

**Detection of Seroconversion to Tick-Borne Encephalitis**

937C0014A Moscow KLINICHESKAYA LABORATORNAYA DIAGNOSTIKA in Russian No 1-2, Jan-Feb 92 (manuscript received 06 Mar 91) pp 47-49

[Article by R. Z. Kuzyayev, L. K. Yaroshenko, V. M. Minayeva, and Ye. V. Kudrevatykh, Perm Medical Institute; UDC 616.98:578.833.26/- 078.33]

[Abstract] This paper presents the results of an investigation on the potential for serological diagnosis in patients with stable antibody titers in paired sera by detecting IgM immunoglobulins to tick-borne encephalitis virus (TBEV). Paired blood sera samples were taken from 182 patients with TBEV in the western Urals from 1987 to 1989, and a conventional hemagglutinin inhibition test was employed to detect the anti-encephalitis antibodies. A hemagglutinin neutralization test detected IgM in 77.6 percent of samples, which suggests an immune reaction to a recent TBEV infection. Revealing the appurtenance of the antibodies to a given class made it possible to differentiate between a recent infection and an anamnestic reaction due to prior infection or vaccination. These results suggest that the proposed method of determining the immunoglobulin class of TBEV antibodies in the blood sera of patients with stable anti-hemagglutinin titers is very informative with respect to indicating recent infection or an early immune response. Tables 2; references 5: Russian.

### The Contemporary State of Vaccinal Prevention of Natural Smallpox in the Armed Forces of Capitalist States

937C0062A Moscow VOYENNO-MEDITSINSKIY  
ZHURNAL in Russian No 11, Nov 91 pp 68-70

[Article by V. I. Evstigneev, Candidate of Medical Sciences, Major General of the Medical Service, A. I. Polozov, Professor, Colonel of the Medical Service Retired, E. G. Zezerov, Professor, Colonel of the Medical Service, S. I. Rybak, Candidate of Medical Sciences, Colonel of the Medical Service, and C. B. Fedorov, Candidate of Medical Sciences, Colonel of the Medical Service; under the rubric "From the Pages of the Foreign Medical Press"; UDC 616.912-084.47:355(1-662)]

[Text] More than 10 years have passed since one of the most dangerous infections, natural smallpox, was eliminated from the face of the earth (the last case of smallpox was recorded in Bangladesh, in October 1975; the last case of alastrim, in Somalia in October 1977). It would seem that enough time has passed to remove the question of the prophylaxis of this disease once and for all from the agenda of national and global public health services. However, analysis of publications on this problem by leading world scientists suggests the reverse. Mankind's fear of natural smallpox is so great that the complete cancellation of vaccination against it will apparently be possible only after the solution by the world scientific community of the ecological, medical, social, and political problems associated with the elimination of this menacing disease. A review of studies of foreign authors on the problem of vaccination against smallpox in military personnel is presented in the present article.

Before the elimination of natural smallpox from our planet, in the light of the peril of the occurrence of epidemic outbreaks of this infection, service persons in the armed forces of various countries were immunized soon after call-up (V. D. Belyakov, 1962; G. Finger, 1960; C. L. Rodriguez, et al., 1965). Like other inoculations, anti-smallpox immunization has not been obligatory in Great Britain, and has been done on a voluntary basis upon entry into military service (R. Duriez, et al., 1966). The Swiss army in which, in connection with the danger of the occurrence of post-vaccinal encephalitis, inoculations against smallpox were discontinued in 1962, is evidently the only exception (R. H. Regamey, 1965).

Revaccinations have been carried out in the armed forces of the leading capitalist countries every one to six years (G. Finger, 1960). Annual revaccination was called for in the U.S. army during stays abroad and every three years in the case of deployment garrisoning of troops on their own territory (P. I. Batten, 1960). Service persons of the Australian army outside the limits of the country have been immunized at a two year interval (W. W. Woodward, 1964). Immunization has been carried out in the Canadian Army every three years (E. J. Young,

1948). In the Bundeswehr the interval between revaccinations has been six years, and three years in the armed forces of the remaining NATO countries (G. Finger, 1960).

Following the eradication of smallpox in the world, the Global Commission for the Certification of Smallpox Eradication recommended to all countries that vaccination against smallpox be terminated in connection with the possibility of the development of serious complications, including those with a lethal outcome. By 1977, when the elimination of smallpox was approaching completion, 16 countries of North America, Europe, and the western Pacific Ocean discontinued planned inoculations of the population against this disease. In the following years the number of countries discontinuing vaccination against smallpox began to increase rapidly, and the last two countries, France and Albania, stopped in 1984 (Z. Jezek, 1988; F. Fenner, et al., 1988).

At the present time vaccination against smallpox is continuing in research workers of laboratories working with some orthopoxviruses (monkeypox and cowpox viruses), and in the research workers of a special epidemiological oversight team who are investigating cases of human monkeypox illness in Zaire (F. Fenner, et al., 1988). Service persons are the only large contingent subject as before to immunization (Z. Jezek, 1988; F. Fenner, et al., 1988). Thus, for example, service persons and national guardsmen in the United States are inoculated against smallpox when they enter the service and are then revaccinated at five year intervals (A. M. Behbehani, 1983; CDC, 1985). Reservists are immunized at the beginning of their two-week annual training at the same intervals. The total number of individuals inoculated in a year is 1 million (A. M. Behbehani, 1983).

F. Fenner, et al. (1988) correctly point out that although the scientific bases for the necessity to stop vaccinating service personnel against smallpox are the same as for the civilian population, the decision to continue inoculating servicepersons is based on other motives, and the WHO [World Health Organization] has not been able to influence it substantially. At the same time, the WHO has received information indicating that as of 1986 10 countries, including Belgium, Great Britain, the Netherlands, Norway, Finland, and Sweden have stopped vaccinating service personnel against smallpox (Wkly Epidem. Rec., 1985, 1986). In the opinion of F. Fenner, et al. (1988), the number of such countries will increase in time.

As should have been expected, based on cases of exogenous inoculation of the virus which are well known to the practice of smallpox inoculation (V. P. Braginskaya and A. F. Sokolova, 1977), after the vaccination of the population was discontinued, reports began to arrive from some countries not only about complications, including severe ones, as the result of primary inoculation against smallpox in new recruits, but about cases of the transmission of the vaccine virus from inoculated

service personnel to civilians who had been in contact with them (Z. Jezek, 1988; F. Fenner, 1988; D. Baxby, 1988). In particular, six relatives and friends of an 18-year old servicewoman who went on leave following vaccination became infected with the vaccine virus from her. Other similar cases have been recorded in the United States (CDC, 1985; Z. Jezek, 1988; F. Fenner, et al., 1988). All the patients recovered, but if they had suffered from eczema or immune deficiency, the probability of severe or even fatal complications would have been much greater (Z. Jezek, 1988).

In this regard an instance of the discovery of generalized vaccinia in an outwardly healthy, new U.S. army recruit, an AIDS virus carrier, primarily inoculated against smallpox in May 1984, deserves attention. A febrile illness developed in him two weeks after the inoculation, accompanied by headache, muscle rigidity of the back of the head, and nocturnal sweats. He was sent to the hospital with a diagnosis of meningitis. A 3 x 4 cm ulcer, and next to it a smaller ulcer, appeared four weeks after the vaccination at the inoculation site. After 48-72 hours from 80 to 100 pustular elements appeared on the skin of the buttocks and the posterior surfaces of the legs; these rapidly changed to ulcers. As a result of prolonged specific treatment (the weekly intramuscular injection of vaccinal gamma globulin over the course of 12 weeks), the ulcers gradually became epithelialized and healed completely. The serviceman died in December 1985. The authors (R. R. Redefield, et al., 1987) who described this case note with alarm that since the vaccination of children stopped in the United States at the beginning of 1970, the majority of new recruits in 1990 will not have been inoculated, and the frequency of postvaccination complications may possibly increase.

In March 1984 the WHO Committee on Orthopoxvirus Infections recommended the exclusion of contacts between new recruits and civilians for two weeks following vaccination in order to prevent the transmission of the vaccine virus between them (Wkly Epidem. Rec., 1984). Two years later the suggestion was made that the vaccination of service persons against smallpox be stopped in order to eliminate entirely the possibility of severe postvaccination complications as well as transmission of the virus of unvaccinated individuals (Wkly Epidem. Rec., 1986).

N. A. Harsley and D. A. Henderson (1987) believe the vaccination of servicepersons against smallpox to be worthwhile, despite the occurrence of complications in the process. The possibility of the use of the virus of natural smallpox by a probable opponent as a biological weapon was the main argument.

A Convention was adopted in 1972 which placed the manufacture and use of biological weapons outside the law. This, however, as a number of authors believe (N. A. Harsley and D. A. Henderson, 1987; F. Fenner, 1988), does not make it possible completely to exclude the likelihood of a purposeful dissemination of the virus of natural smallpox or its use for terroristic purposes. At the

present time access to this agent, which since 1983 has been stored with the observation of all necessary security conditions only in two institutions, the Center for Disease Control (United States) in Atlanta and the Moscow Scientific Research Institute of Viral Preparations, is severely limited (F. Fenner, 1988; F. Fenner, et al., 1988). But it is impossible to guarantee the impossibility of the dissemination of the virus from these laboratories in the course of working with them or as the result of possible extreme situations (H. L. Abrams and W. Von Kaenel, 1981).

In March 1986 the WHO Committee on Orthopoxvirus Infections reached the conclusion that the cloning of DNA can serve as suitable standard material for the resolution in the future of possible diagnostic problems in case of the appearance of cases which are suspicious for smallpox; the availability of a culture of the virus for purposes of scientific study is no longer worthwhile, and there is no need to keep stores of the viable virus (Wkly Epidem. Rec., 1986). The destruction of the virus of natural smallpox will be the final measure, and fear of this infection will be dispelled forever (Z. Jezek, 1988).

The discontinuation of the vaccination of servicepersons, as D. Baxby (1988) points out, is connected with political decisions concerning the renunciation of the use of virus of natural smallpox as a biological weapon agent, and with the problem of monitoring. The vaccination of servicepersons against smallpox was not carried out in the USSR from 1979 through 1983. However, in light of the fact that immunization was continuing in the armed forces of the countries of Western Europe, the practice was renewed in the Soviet Union (N. A. Harsley and D. A. Henderson, 1987).

Analysis of the studies reviewed suggests that the problem of the vaccination of military contingents against smallpox is being resolved equivocally. The proponents of its discontinuation have weighty reasons: the global eradication of natural smallpox, the danger of the use of the live vaccine, the need to strengthen trust between countries and the observation of the convention on the prohibition of the use of biological and toxic weapons. Those who argue for the continuation of smallpox inoculation of servicepersons also have their reasons: the presence of cultures of the natural smallpox agent in two institutions of the United States and the Soviet Union which are reference centers of the WHO, and the formation of ecological niches after the eradication of natural smallpox and discontinuation of vaccination.

The risk of the return of epidemics provoked by an agent similar to the virus of natural smallpox should not be exaggerated. According to contemporary notions the possibility that any orthopoxvirus, including the monkeypox agent, will fill the ecological niche left empty by natural smallpox, seems improbable, since the differences in genetic structure between the virus of natural smallpox and other known orthopoxviruses are quite substantial (A. M. Behbehani, 1983; Z. Jezek, 1988; D.

Baxby, 1988; F. Fenner, 1988). At the time, Z. Jezek's (1988) pointing out that the "number of poxviruses isolated from animals is increasing, and it is necessary to exercise vigilance so that they do not become dangerous for man" is valid.

In the developing situation it is evident that preference should be given to the proponents of a balanced approach to the resolution of the problem under consideration who take as a point of departure the fact that with time the necessity of immunizing military contingents against smallpox will decline; however, a transitional period will be necessary for this. The following problems must be resolved during this period: political—the strict observation of the 1972 Convention; biological—the destruction of the stored cultures of the virus of natural smallpox; medical—giving up the use of the vaccine virus for the creation of polyfunctional vector vaccines; ecological—definitive proof of the impossibility of the occupation of the ecological niche which has developed by another orthopoxvirus which is pathogenic for man.

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**Facilitation of Motor Recovery in Partially Decorticated Rats by 2G Centrifugal Force**

937C0072A Moscow *BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY* in Russian Vol 111 No 6, Jun 91 (manuscript received 20 Jun 90) pp 566-567

[Article by I.B. Ptitsyna and V.V. Tselikova, Physiological Department, Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad; UDC 612.825.4:612.47]

[Abstract] Impact of 2G centrifugal force on motor recovery was assessed in 180-200 g outbred albino rats that had undergone partial left hemispheric decortication of posterior limb projection area. Clinical evaluation was in terms of resistance between the first and fifth toe. The "therapeutic" regimen consisted either of (Group I) a 2G centrifugal force in the dorsoventral projection for ten days beginning with second postoperative day, 20 min/day, or (Group II) 40 min/day for 30 days beginning within 24 hours of decortication. The results showed accelerated motor function recovery in both situations. In general, Group II regimen was more beneficial for motor recovery. Improvement was attributed to activation of brain stem motor formations by the apparent increase in body weight during centrifugation rather than to activation of the vestibular system. Figures 2; references 7: 5 Russian, 2 Western.

**Quantitative Estimates of Influences of Efferent Copy and Extraocular Proprioception on Visual Evoked Potentials Before and During Horizontal Saccade in Cat**

937C0013A Moscow *SENSORNYE SISTEMY* in Russian Vol 6 No 2, Apr-Jun 92 (manuscript received 11 Feb 91) pp 54-58

[Article by B. Kh. Baziyan, Brain Research Institute, Moscow; UDC 612.846.2]

[Abstract] The effects of efferent copy and proprioceptive signalization were investigated separately to better understand the nature of saccadic suppression. Short (50  $\mu$ sec) diffuse flashes of light were presented against a homogenous matte visual background that covered the cat's entire field of vision. Analysis revealed that the evoked potentials prior to saccade in comparison to evoked potentials during glance fixation changed little in all of the structures investigated, while suppression was more evident during saccade, with the exception of evoked potentials from the external geniculate body. The data showed that the two factors governing visual suppression during saccade are the effect of efferent copy and proprioception. In addition, it was demonstrated that suppression is due more to proprioceptive effects than efferent copy. In conclusion, the results suggest that visual suppression occurs not only because of the suppression of afferent messages, as is clearly expressed in the case of

evoked potentials during saccade, but also in the latter stages of processing incoming afferent signals, when perception becomes recognition. Figures 1; tables 2; references 5: 2 Russian, 3 Western.

**Dalargin-Binding Synaptic Proteins in Rat Brain: Isolation and Comparison With Opiate Receptors**

937C0028A Moscow *BIOKHIMIYA* in Russian Vol 57 No 5, May 92 (manuscript received 18 Feb 91; in final form 21 Oct 91) pp 663-670

[Article by G.A. Izykenova and N.P. Taranova, Laboratory of Functional Neurochemistry, Institute of Physiology imeni O.P. Pavlov, Russian Academy of Sciences, St. Petersburg; UDC 577.352.3]

[Abstract] Assessment of dalargin—a synthetic leu-enkephalin analog—binding sites in brain synaptosomes isolated from 150-200 g male Wistar rats showed them to be identical with opioid receptors in the CNS. The synaptosomal membranes were obtained by affinity chromatography on dalargin- $\omega$ -aminohexyl-Sepharose 4B and elution with a solution of DAGO opioid peptide (specific agonist of  $\mu$ -type receptors). The eluted dalargin-binding proteins were then shown to bind naloxone with a  $K_d$  of 6.6 nM and a  $B_{max}$  of 690 pmoles/mg. Electrophoretic analysis showed that the major component was a 42 kD protein accompanied by two minor (< 5 percent) 29 and 67 kD proteins. Figures 5; tables 2; references 19: 7 Russian, 12 Western.

**Detection and Properties of Serotonin-Modulated Protein Fraction Vis-A-Vis Avoidance Behavior in Rats**

937C0065B Moscow *BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY* in Russian, Vol 111 No 6, Jun 91 (manuscript received 29 Nov 90) pp 5-7

[Article by G.G. Gasanov and A.A. Mekhtiyev, Laboratory of Motivated Behavior and Learning, Institute of Physiology imeni A.I. Karayeva, Azerbaijan SSR Academy of Sciences, Baku; UDC 612.821.3.085.1: [612.825.015.348.014.46: [615.357:577.175.52]

[Abstract] Direct application of  $10^{-3}$  M serotonin solution to the occipital cortex of 200-280 g male rats resulted in reduction ( $p < 0.05$ ) of fraction 6 (PAG disc electrophoresis) of cortical soluble proteins, whereas application of norepinephrine was without a telling effect. Assessment of the impact of rabbit anti-fraction 6 antibodies (10  $\mu$ l; 5 mg/ml) introduced into the left lateral ventricle of rats had the effect of enhancing ( $p < 0.05$ ) motor activity in bright/dark chamber avoidance behavior. Accordingly, the data were interpreted as demonstrating the involvement of serotonergic system in orientative behavior via modulation of selective cortical soluble proteins. Figures 2; tables 2; references 15: 8 Russian, 7 Western.

**Modulation of Adrenergic Control of Heart Rhythm by Delta-Sleep Peptide**

937C0065C Moscow BYULLETEN

EKSPERIMENTALNOY BIOLOGII I MEDITSINY

*in Russian, Vol 111 No 6, Jun 91 (manuscript received 27 Jun 89) pp 7-9*

[Article by L.S. Ulyaninskiy and M.A. Zvyagintsev, Laboratory of Experimental Cardiology, Scientific Research Institute of Normal Physiology imeni P.K. Anokhin, USSR Academy of Medical Sciences, Moscow; UDC 615.214.3:547.96]:015.4:612.178.2]

[Abstract] Modulation of sympathetic regulation of the heart by the delta-sleep peptide (DSP) was investigated in rabbits under pentobarbital sodium anesthesia following resection of both sympathetic nerves and stimulation of the stellate ganglion. Ganglionic stimulation induced a positive chronotropic effect, increasing the heart rate by 48 beats/min with a latent period of 17 sec. Administration of 60 nM/kg of DSP 30 min before stimulation of the ganglion reduced the positive chronotropic effect of stimulation, limiting the increase in heart rate to 35 beats/min with a latent period of 27 sec. Intravenous administration of rabbit antiserum against DSP (25  $\mu$ L/kg; 1:1000) prior to stimulation had the opposite effect. These findings demonstrated that DSP modulates parasympathetic control of the heart not only by potentiating vagal discharge rate, but also by attenuating sympathetic influences. Figures 2; references 11: 9 Russian, 2 Western.

**Cytochemical Evidence of Short- and Long-Term Activation of Dopaminergic System in Rat Brain**

937C0072D Moscow BYULLETEN

EKSPERIMENTALNOY BIOLOGII I MEDITSINY

*in Russian Vol 111 No 6, Jun 91 (manuscript received 14 May 90) pp 41-42*

[Article by L.M. Gershteyn, T.L. Chebotareva and A.V. Sergutina, Laboratory of Cytochemistry, Scientific Research Institute of the Brain, USSR Academy of Medical Sciences; UDC 612.82.018:577.175.523].019.08]

[Abstract] Open-field trials were performed with 240-270 g male Wistar rats in order to assess the relationship between dopaminergic mechanisms and horizontal motor activity. Intraperitoneal administration of 25.5 mg/kg of medopar-125 (levodopa + benserazide) for three or 14 days resulted—in both cases—in marked depression of motor activity with, however, different cytochemical changes in the sensorimotor cortex (SMC), caudate nucleus (CN) and nucleus accumbens (NA). Drug treatment for three days led to marked increases in aminopeptidase activities in the CN and NA (est. 15-30 percent), accompanied by 15-23 percent depression of cytoplasmic protein. Treatment for 14 days ensured baseline aminopeptidase activities and elevated protein levels (ca. 50 percent above baseline). Significant changes in layer III of the SMC at three days consisted of protein elevation (ca. 20 percent), while layer V sustained a 25 percent decrease in cytoplasmic protein. After 14 days of treatment all values in the SMC were essentially at control levels. These findings demonstrated that administration, the molecular sequelae at the neuronal level are quite different. Figures 1; references 10: 7 Russian, 3 Western.



**'Ukrmedbioprom' Director on Measures To Increase Pharmaceutical Supplies**

927C0524A Kiev PRAVDA UKRAINY 13 May 92 p 2

[Article by Valeriy Pechayev, General Director, "Ukrmedbioprom": "Shortage of Drugs and How To Eliminate It"]

[Text] The acute shortage of pharmaceuticals which is occurring in Ukraine and other CIS countries has several causes. The primary cause is the absence in the former Soviet Union of factories capable of producing high quality preparations which meet international standards and the meager, or more accurately nonexistent, investment of scientific resources in this direction. Additionally, there were incorrect approaches to the expenditure of currency, which was chiefly directed towards covering gaps in the pharmaceutical nomenclature via purchases from foreign firms.

The shortage is connected with the collapse of the Soviet Union, which led to the rupture of economic connections between the firms of the pharmaceutical industry. While Ukraine has long-standing large-scale industrial facilities for pharmaceutical manufacturing, it remains true that its chemical-pharmaceutical industry can not function without raw materials from Russia, Armenia, Latvia, Azerbaijan, etc.

What to do so that there will be sufficient supplies of all necessary pharmaceutical preparations in our pharmacies and therapeutic institutions? According to specialists from "Ukrmedbioprom" it is necessary to restore the disrupted links with partners in the CIS and arouse interest in the production of synthetic substances by Ukrainian chemical firms. We must consolidate the efforts of all Ukrainian scientific centers and institutions with the goal of organizing internal production of vital preparations.

The path to restoring the severed links includes direct agreements with producers, particularly the Russian "Farmindustriya" corporation, which is the leading supplier of synthetic substances.

The state company "Ukrkhimprom" and "Ukrmedbioprom" have developed a program for increasing the production volume of substances for which there are acute shortages, based on expanding the chemical industry and developing original formulations. Our firm is the coordinating center for this program.

The goal is to set up production of pharmaceuticals based on substances prepared using improved technology or on new substances. We will include the synthesis of drugs which are analogues of those produced abroad. In addition, according to the program we will conduct scientific research and experimental design work, including work in biotechnology.

Realization of this complex program has already started; production of analgesics, anti-inflammatories, and antipyretics has been instituted in Ukrainian factories.

Much work in the production of acetaminophen which meets all the requirements of foreign pharmacopeias has been conducted by the "Krasitel" Rubezhanskiy PO collective (director V. I. Kolodyazhnyy). The "Zdorove" pharmaceutical company has started production of new tablet drugs. A formulation developed by the State Scientific Center for Pharmaceuticals (GNTsLS) using original technology (Yu. V. Shostenko, A. T. Sheni, and others), which does not have analogues in CIS countries, is atselizin, which heads the list of WHO [World Health Organization] recommended primary drugs for lowering body temperature in acute febrile states, for thrombosis prophylaxis, for anaesthetization, etc.

Arsenal is a drug for bronchial asthma which was imported into the former Soviet Union. A series of effective formulations in aerosol form have been prepared in the GNTsLS for both attenuating acute asthmatic attacks and for long-term preventive therapy.

In addition to the above drugs, the "Ukrmedbioprom" company produced eighteen vital pharmaceutical preparations in 1992. During 1993-1995 we are planning to introduce 96 pharmaceuticals, including 15 cardiovascular drugs, nine for treating gastrointestinal diseases, 24 analgesics and anti-inflammatories, and a series of drugs recommended for immunodeficient states, treatment of cancer, and diabetes. At the present time the question of creating a common facility with western firms for insulin production is being worked out. Thus one may now speak of creating a stockpile to minimize the shortage of pharmaceuticals in Ukraine.

But how can this shortage be completely eliminated? This question can only be answered by technical re-equipment of the "Ukrmedbioprom" firm and by creating new firms. By the way, we have not conducted such construction in more than 20 years. In this regard, the purchase of just blood-sugar-lowering drugs costs about 100 million hard rubles yearly. Starting in 1991 construction was frozen due to the absence of a budget allocation or state credit.

In order to satisfy the requirements for pharmaceuticals in Ukraine we must purchase imported equipment for production, packaging lines for ointments, suppositories, capsules, aerosols, and transdermal drugs, which will permit greatly decreased spending on imported drugs.

Minister of Health Yu. P. Slizhenko has endorsed our suggestions and appealed to Prime Minister V. P. Fokin with a request to release currency for top-priority financial work in pharmaceutical production and purchasing technological equipment. Organizing pharmaceutical factories will make it possible to decrease imports by 27 to 30 million dollars in total per year.

One should remember that no developed country produces the complete assortment of finished pharmaceuticals in all pharmaco-therapeutic groups, but rather covers its requirements thanks to cooperation.

The introduction of original developments by Ukrainian scientists into domestic factories will be the first step towards possible cooperation between the countries of Europe, Asia, America.

It appears that everything remains more or less in place, and one may have confidence that we will liquidate the ruptures. But there are many "buts," such as the liberalization of prices, for example. As a result of shortages, the pharmacy network has dropped such vital drugs as diphenhydramine, dibazol, papaverine, plasmol, lobeline, and others. In the first quarter of 1992 wholesale prices for medicines increased by a factor of 4.4, while retail prices, which previously were two or more times lower than wholesale, increased by a factor of 10-15.

In order to stabilize the situation, in our opinion, it is necessary to allocate currency resources to the purchase of imported raw materials, to solve the question of signing intergovernment agreements with the states of the former Soviet Union regarding coordinated production, taking into account the limits of profitability for raw materials, reagents, and other substances which are used in pharmaceutical production, and of the pharmaceuticals themselves, to introduce health insurance, and to allocate budget resources to the financing of the complex's program for the development of the Ukrainian pharmaceutical industry.

#### **Invalids' Statement on Medical Shortages**

927C0524B Moscow *RABOCHAYA TRIBUNA* in Russian  
16 Jun 92 p 2

[Unattributed article: "They Left Us by the Roadside"]

[Text] An appeal for all the invalids in Russia was adopted in Moscow, at a joint conference of the Rossiyskiy Invalid Fund organization, the invalids of the Afghanistan war, the metropolitan invalid association "Mosink," and the association of veterans of the Afghanistan "Contingent."

In the appeal it says: "Nothing has been arranged for our lives to date. Medical services are at a very low level. There are no medicines. Wheelchairs, canes, crutches, hearing aids, prostheses, and elementary devices are lacking, not to mention specialized automobiles with equipment for hand operation. Invalids appear to be unprotected in the current situation."

How to correct the situation which gave rise to this position? In the opinion of the invalids themselves, it is necessary to require a public accounting from all state institutions which are concerned with the question of invalids, as well as their plans for the future; and to work out a package of judicial documents concerning social protection.

#### **Tajikistan Decree on Pharmaceuticals Supply**

927C0529A Dushanbe *NARODNAYA GAZETA* in Russian  
4 Mar 92 p 2

[Article by S. Kendzhayev, chairman of the Supreme Soviet of the Republic of Tajikistan, with dateline of 20 February

1992, Dushanbe: "Decree of the Presidium of the Supreme Soviet of Tajikistan on Problems Associated With Supplying Pharmaceuticals to the Population of the Republic of Tajikistan"]

[Text] After discussing the information presented by A. I. Subbotin, the chairman of the Tajikistan Supreme Soviet Committee for Health Care, Social Services, the Environment, and Problems of the Family and Women, the Presidium of the Tajikistan Supreme Soviet noted that, at this stage, the problems associated with the availability of pharmaceuticals to the population are considerably more acute than they were in 1989-1990 and are getting worse.

Since 1990, and particularly since 1991, deliveries of requested medications and dressings have deteriorated considerably. In 1991, enterprises of the former USSR Ministry of Medical Industry failed to deliver more than 260 medications: For 70 of their drugs, less than 20 percent of the funds were released, and for 155 drugs, less than 50 percent.

Because of changes in the accounting system existed and the absence of financing at the time from a centralized currency fund, vitally important groups of imported medications involving a total of 381 drugs worth 7.3 million rubles [R] were not delivered.

Overall, in 1991, only 73 percent of the republic's needs for pharmaceuticals and other medical items were met. Sorely felt were shortages of cardiovascular, psychotropic, and diuretic drugs, as well as those of drugs used in emergencies and by the anesthesiology-resuscitation service.

Against the backdrop of the shortage that has come about for a whole array of medications, the variety of such medications has expanded on the black market, at speculative prices. For example, on Sunday, January 19 of this year, in Dushanbe's Giprozemgorodok alone, approximately 40 drugs were for sale by profiteers—from norsulfazol, citramon, and analgin to rheopyrin, Voltaren, cerebrollysine, and hyaluronidase—the price of a convertible-currency unit's worth or a box ranging, accordingly, from R3-5 to R50-160 or even R260.

It is anticipated that drug deliveries in the current year will be worse still. As of January 10, 1992, the Tadjikfarmatsiya RPO [republic production association] concluded only 39 contracts with suppliers, versus 139 contracts signed in the same period last year. For reasons associated with the availability of raw materials to suppliers, more than 230 contracts were not unsigned.

In that context, the acquisition of vitally important groups of medications from foreign countries for hard currency is crucial.

In addition, it should be noted that, for reasons known to everyone, the above situation began to come about as such back in 1990 and was expected to get worse. The republic's Ministry of Health, however, plus other involved ministries and departments, failed to come up

with a solution for the complex of problems associated with reducing as much as possible or eliminating the shortage of vitally important groups of medications, blood substitutes, or dressing materials; they failed to create a pharmaceutical industry or a phytopharmacy, coordinate the activities of the ministries, departments, enterprises, and businesses involved, directly or indirectly, in the cultivation, procurement, production, and consumption of pharmaceutical raw materials, as well as chemical disinfectants.

Meanwhile, one promising, underutilized approach to make up for the drug shortage remains the assimilation of technology for processing the more than 50 species of medicinal plants growing in the republic and efficient use of those plants, plus an expansion of their applications, based on scientific evidence, in medical practice. Yet, in that area, no clear cooperation has been established between procurers and consumers in terms of specific contracts. That is illustrated by the fact that dog rose berries cannot be found in pharmacies or hospitals, whereas the Tadjhikles LPKhO [forestry production association] and Tadjhikpotrebsoyuz have some 10 and 80 tons of them, respectively. Another example: In 1991, production levels at the pharmaceutical plant of RPO Tadjhikfarmatsiya dropped because medicinal plants were unavailable in the required amounts and variety, whereas nearly 430 tons of such plants were procured by the Tadjhikles LPKhO system alone.

Export of medicinal plants and chemical disinfectants to areas outside the republic was done without the participation of RPO Tadjhikfarmatsiya and without the conclusion of contracts economically beneficial to health care.

The Tadjhikmumiye Association, the Ministry of Health, and the Academy of Sciences of Tajikistan have been slow in meeting the goals set in 1990 by the government with respects to the collection, processing, and use of mumiye and mumiye-containing materials.

In light of the above information and for the purpose of improving the availability of pharmaceuticals to the population for now and the future, the Presidium of the Supreme Soviet of Tajikistan decrees the following:

1. The information presented by A. I. Subbotin, chairman of the Tajikistan Supreme Soviet Committee for Health Care, Social Services, the Environment, and Problems of the Family and Women, will be taken into account.

2. The Tajikistan Ministry of Health (Minister D. I. Inomov) will be made aware of its inadequate supervision and poor organization of the work involving the solution of problems associated with the availability of drugs to the people of the republic.

3. The unsatisfactory work of the Ministry of Internal Affairs (Minister M. N. Navzhuvanov) in enforcing the Tajikistan law "On banning the unauthorized collection and selling of mumiye and mumiye-containing raw

materials" and in stopping the illegal and unauthorized collection and selling of mumiye and mumiye-containing raw materials is noted, and the guilty individuals will be made to answer under the law.

4. The Tajikistan Prosecutor's Office and the Tajikistan Ministry of Internal Affairs are commissioned to investigate the activities of the Tadjhikmumiye Association in terms of its adherence to the law aimed at preventing the misappropriation of mumiye and mumiye-containing substances and the profiteering associated with them.

5. The Tajikistan Ministry of Health is responsible for the following:

- in cooperation with the Tajikistan Academy of Sciences, the Tajikistan Ministry of Industry Affairs, the Tadjhikles LPKhO, the Tajikistan Environmental Protection Ministry, and other interested ministries and departments, developing a detailed program aimed at improving the availability of medications, medicinal plants, and medical and hygiene-related items for the near and distant future, and then submitting that program to the Tajikistan government within two months

- in cooperation with the Tajikistan Academy of Sciences, exploring the possibility of setting up sound clinical trials of mumiye-containing pharmaceuticals in departmental clinics and to set up the manufacture of those pharmaceuticals if the trials are successful

- setting up within the RPO Tadjhikfarmatsiya a specialized trade institute for acquiring and selling chemical reagents used in medical practice

- establishing business ties with the Union of Cooperatives and Entrepreneurs, with associations, and with firms and using their potential on a mutually beneficial basis for the purpose of solving the problems associated with the availability of drugs, as well as setting up the production of medical items, instruments, and equipment

- taking additional measures to guarantee the proper prescription and use of pharmaceuticals and to stop their being taken from departmental facilities

- in cooperation with the Tadjhikles LPKhO and Tadjhikpotrebsoyuz, exploring the possibility of creating an enterprise to process medicinal plants and obtain the raw materials used in the production of medications and in the food industry, and initiating the construction of such an enterprise

6. In cooperation with the Tadjhikles LPKhO, the Environmental Protection Ministry, and the Ministry of Health, the Academy of Sciences is to begin, this year, a study of the availability of wild medicinal herbs, berries, and fruits and is to determine how they can be used properly; it is to develop measures aimed at preserving or increasing their reserves in the republic.

7. The Tajikistan Environmental Protection Ministry is to develop a statute regarding medicinal plant collection and is to determine the form and procedure for issuing licenses to procure all species of wild medicinal plants and mumiye-containing raw materials.

8. The Tajikistan Council of Ministers is responsible for the following:

- exploring the possibility of providing the Tajikistan Ministry of Health 10,000 tons of aluminum and as much as 20,000 tons of cotton fiber every year for 1992 and 1993 for the specific purpose of purchasing on a priority basis the vitally needed medications requested via import for those years and realizing letters of intent signed with foreign firms for the creation of joint ventures for the manufacture of pharmaceuticals from local raw materials
- based on available completed designs, examining and solving the problem associated with the initiation of the construction of pharmaceutical plants in 1992
- exploring the possibility of establishing a Pharmaceutical Industry Committee (Tadzhikfarmindustriya) in the Tajikistan Council of Ministers by using staff members of the PAO Tadzhiklekrasrom
- instructing the License Committee not to grant permits allowing export from the republic of medicinal plants, mumiye and mumiye-containing raw materials, or chemical disinfectants without the coordination with RPO Tadzhikfarmatsiya or without contracts beneficial to the health care system

9. It will be taken into consideration that in 1992 the Tadzhikvneshtorg Production Association general director (A. M. Mukhtashev) will provide Tadzhiklekrasrom with R4 million in order to initiate the construction of a pharmaceutical plant in the city of Dushanbe. The Tadzhiklekrasrom general director (G. Odinamamadov) is to start the construction of a pharmaceutical plant in the city of Dushanbe as soon as the Tadzhikvneshtorg funds are transferred.

10. Enterprises, state farms and collective farms, associations, firms, joint ventures and small businesses, and cooperatives of the republic that have hard currency are encouraged to make their contributions, on a mutually beneficial basis, to the solution of the problems associated with the availability of pharmaceuticals, with the acquisition of production equipment for processing medicinal plants and producing drugs from local raw materials, and with the construction of a chemical-and-pharmaceutical plant.

### **Uzbek Educator on Medical Training**

927C0538A Tashkent PRAVDA VOSTOKA, in Russian  
9 Jun 92 p 3

[Article by Kh. Karimov, Rector of the Second Tashkent State Medical Institute, Professor, Chairman of the Council

of Rectors of the Medical and Pharmaceutical Higher Educational Institutions (VUZy) of the Republic of Uzbekistan, under the title: "Medical Education: A New Concept"]

[Text] The system that has developed for the training of public health specialists has led our country to first place in supplying the population with physicians. However, their inadequate professional preparation has elicited valid complaints.

It has not been possible to solve the problems of raising the quality of medical care by efforts to improve the material and technical base of the republic's medical higher educational institutions [vuzy], by the introduction in them of new organizational and methodological teaching techniques, or by the review and correction of curricula and syllabi. It has become clear that the resuscitation of the existing system of the training of medical personnel will yield nothing, and, consequently, it is necessary to concentrate efforts in the search for a new educational concept.

Various systems of education have had different historical fates. And thus specific formulations are not possible here without taking account of specific national and ethnic conditions in various countries.

Thus, the Western model of education is represented by a two-stage system: after four years of learning the students receive a general education and preprofessional preparation; the second stage then provides for the training of highly qualified specialists.

Ukrainian scholars have come to the same resolution, based on the Western European model, regarding the two-stage training of specialists, corresponding to the baccalaureate and the master's levels. In their opinion, not less than nine years are required for the training of a physician holding the right to independent practice. In Belarus the medical education reform concept established a 12 year period. In our republic, as things have evolved today, the shortest physician training period is six years. On the other hand, a specialist entitled to practice independently in the United States is trained for about 14 years, on the average.

In Turkey, education in the medical faculties of the universities is also two-staged: The length of the post-diploma education depends on the specialty selected; the right to undertake medical practice is obtained after 9-11 years.

The proposed medical education concept was worked out in the First and Second Tashkent State Medical Institutes [TashGosMI], was shaped in the process of an analysis of domestic and world experience, and assumes a shift from the wide-ranging, information-laden to the focused, in-depth, basic subjects-oriented realization of an actually functioning system. It ensures equal opportunities for obtaining an appropriate diploma, while simultaneously protecting those contingents whose initial capabilities are limited (graduates of rural schools). Trends, such as the increased role of the secondary



school, the comprehensive development of the personality, and the need for the improvement of vocational guidance services, which are common to all regions are reflected in it.

The reorganization of the higher medical education system, in our view, must begin with the preparation of the applicant group, since the traditional school cannot accomplish the task of preparation for education in the higher educational institutions [vuzy].

For this purpose it has been proposed that the gymnasium and lycee forms of working with students be cultivated. The formation of specialized schools with a medical-biological orientation (medical lycees) has been recommended for the improvement of vocational guidance, not only in Tashkent, but in the rural areas as well.

The creation of medically oriented residential schools for rural youth on a competitive or contract basis will create an improved vocational guidance system in the rural areas, which is especially important for Uzbekistan, a large part of whose population lives in kishlaki [rural villages] and villages.

The training of medically educated specialists (secondary and higher levels) can be accomplished in a unified system of a higher medical educational institution in which curricula and syllabi will be flexible and coordinated. This will make it possible to regulate the contingent of students, to offer the opportunity to applicants inadequately prepared for the higher educational institution to obtain nonetheless a medical worker speciality ("patient care nurse", "special department nurse").

The higher medical educational institutions of the Republic of Uzbekistan prepare personnel in the "general medicine", "medical prophylactics", "pediatrics", and "stomatology" specialties. It is necessary today in public health policy to take account of the potentials of nursing personnel, not only in traditional patient care, but in prophylactics, rehabilitation, and psychosocial assistance for the population as well.

The experience of foreign countries suggests the usefulness of placing high demands on those entering the higher educational institutions. For example, graduates of schools entering a university medical faculty in Turkey undergo selection examinations, conducted annually by the Turkish Selection Center, in two stages. The first stage (first half of April) determines the level of verbal and intellectual capacities of the applicants, and the second (second half of June) determines the level of mastery of school subjects. The purpose of this examination is the determination of the capacities of the candidates for training. Thousands of graduates apply annually to medical faculties, but only five out of a thousand are accepted for the first year.

Rigorous selection and a competitive system for all graduates of secondary schools, medical lycees, medical residential schools, and secondary special medical institutions are the first stage of pre-higher educational

institution training. Further training in the higher medical educational institution will then be determined entirely by and depend on the educational institution itself, its personnel and qualifications, and on the organization of the educational process, curricula, and syllabi. That is, the scope of the objectives for whose quality the higher educational institutions alone are responsible will be determined.

In our opinion, the republic's leading higher medical educational institutions are ready, with respect to their intellectual potential, for the shift to the two-stage education of students, including preclinical general biological preparation, to be carried out in the first two years of training and capped off by examinations envisaged by the curriculum.

The general medical training (three years) is completed in the fifth year by the taking of examinations according to the curriculum. Those passing these exams continue training in the following years. Those not passing the comprehensive examinations are granted a feldsher's diploma, and are assigned to practical work.

The students undergo training in the sixth and seventh years in accordance with the general practice physician's curriculum. The training is carried out by the principal clinical departments at the institute's clinical centers. The preparation is capped off by the taking of state examinations in medical diseases, surgical diseases, and obstetrics and gynecology. The graduate is granted a medical baccalaureate diploma, which confers the right to practice independantly as a general practitioner. The graduate does not have the right to work as a physician-specialist.

In order to become a physician-specialist (master's degree), the graduate must undergo the post-diploma, second stage of training in the master's program for two-five years (depending upon specialty). Training in the master's program is accomplished in the medical institution's clinical centers. Those undesirous [of undertaking this] may work as general practitioners. Upon completion of the master's program, physicians take an examination in the specialty of an independant examining board, and if they succeed in passing it, receive a diploma certificate granting the right to work as a physician-specialist.

Thus, the clerkship, internship, and clinical residency existing at the present time are combined in the proposed concept, and a new organizational form of training is created, with a total length of two to five years, depending on the specific requirements for the training of the physician-specialist of various specialties.

Consequently, a "general medicine" specialty student in a higher medical educational institution becomes a general practitioner after seven years (baccalaureate) or a physician-specialist after nine to 12 years (master's degree). Continuous professional education and periodic certification or upgrading of medical qualifications follow thereafter.

A physician can apply for the former category after five years of working as a specialist, and for the higher category after 10 years. Economic incentives will play a major role in the process.

The graduate of the higher medical educational institution must completely meet the physician's qualifications (model) requirements. The qualifications of a physician in their turn must be complete, and must ensure a guaranteed level of the specialist's proficiency, including the achievement of international standards of preparation, as well as the convertibility of the diploma when a uniform mechanism of international certification of the physician's diploma is introduced.

The successful implementation of the concept which has been worked out requires additional appropriations for the development of the material and technical base of the educational institutions and the strengthening of the scientific teaching personnel, the transformation of the economic, legal, and organizational mechanisms, and the overcoming in students and teachers of alienation from the end results of their work. Decreasing the number of students in the groups, which is necessary for the activation of their creative potential, will require additional resources. They are also required for the improvement of the methods of retraining and upgrading of the qualifications of specialists of the respective specializations, and for the further development of medical science.

And this will have to be pursued, since otherwise the established goal, the improvement of medical education and the unification of the training of specialists in accordance with international experience, will not be reached.

### **St. Petersburg Contemplates Pharmacy Development Program**

927C0540A St. Petersburg SANKT-PETERBURGSKIYE VEDOMOSTI in Russian 15 May 92 p 1

[Article based on information sent by the St. Petersburg mayor's office and assembled by the press service of the St. Petersburg Administration of the Russian Ministry of Security: "Why Pharmacists Have a Headache"]

[Text] A tense situation with respect to the sale of pharmaceuticals has come about in St. Petersburg. Despite the fact that the pharmacy warehouse of the wholesale/production enterprise PO Farmatsiya is filled with goods, the enterprise is unable to pay for them, primarily the result of a drop in the volume of pharmaceutical sales that is due to the dramatic rise in the prices of pharmaceuticals. And as of 1 June, when the revocation of privileges involving the acquisition of drugs goes into effect, the volume of sales will probably drop even more.

In addition, the sales of the 130 drugs that are in greatest demand are unprofitable, and the pharmacies themselves aren't making a profit. On that pretext, a campaign for the privatization of pharmacies that does not give the pharmacy workers a say in the matter is being

conducted in several districts of the city, even though a municipal-pharmacy development program has been in the mayor's office for examination since March. Sometimes, even pharmacies that sell narcotic drugs and drugs for oncology patients are destined to be transferred to private ownership.

Representatives of the local administration often simply announce to the workers of a pharmacy that the pharmacy is about to be sold at auction. Specialists feel that that could lead in the future to a restructuring of the pharmacies into commercial stores selling a different assortment of goods. Moreover, there exists the danger of a reduction in quality control for pharmaceuticals. All that would deepen the crisis in the supply of drugs to the people, which could lead to unpredictable social consequences.

### **Russo-German Medical University Proposed**

927C0540B Moscow ROSSIYSKAYA GAZETA in Russian 4 Jul 92 p 2

[Article by Yana Yurova, Oleg Zlobin, special correspondents for ROSSIYSKAYA GAZETA, filed in Saratov, under the rubric "Health Care": "The Curtain Over the Volga Has Been Lifted"; first paragraph is source introduction]

[Text] "We must not allow medicine in these very difficult times to lose its best traits: humanism, selflessness, and a high sense of responsibility for the future of the people"—such is the main idea at the Russian assembly "Youth and Health," which is under way at this time in Saratov.

Medical scientists from CIS states and guests from FRG, France, Czechoslovakia, Spain, and the United States have come to this city on the Volga to participate in an international forum. The organizers of such a representative assembly are the Russian fund Zdorovye Cheloveka [Health of the Individual] and one of the leading medical higher educational institutions of the country, the Saratov Medical Institute.

For the many participants and guests of the assembly— young scientists and specialists and renowned academicians and doctors of science—Saratov has offered its best assembly halls, which, for three days, have been the locus of dozens of symposia, seminars, and discussions on the burning issues of health and the environment, economics, ethics, religion, morals, and history.

"This is the first event of such scale in the city, which, until recently, was behind a dense iron curtain," noted the rector of the Saratov Medical Institute, Vyacheslav Kirichuk. "We have seen for ourselves that true spirituality knows no boundaries. Intellectuals of different countries are having an easy time finding a common language. If only the politicians could have as easy a time finding a common language."

Evoking a great deal of interest is the exhibit, opened in Saratov in the assembly, of medical equipment and pharmaceuticals from the leading firms of Russia and

the West. It is noteworthy that several innovations presented here are nothing less than the result of successful conversion, which—no secret to anyone—is having a difficult time at local enterprises. The assembly also discussed the issue of opening in the near future in the capital of the Volga region an independent Russo-German university in which prominent world scholars will lecture. That institution of learning, fundamentally new for Russia as such, will be subsidized not by the state, but by philanthropic contributions and donations made by sponsors.

### Heart Disease Campaign in Kiev

927C0540C Kiev *VECHERNIY KIEV* in Russian  
13 Apr 92 p 2

[Interview with Valeriy Vasilyevich Zboromirskiy, chief internist of the Health Care Administration of the Kiev Executive Committee and head of the Department of Polyclinical Therapy of the Kiev Medical Institute, by *VECHERNIY KIEV* correspondent Nikolay Zakrevskiy, under the rubric "Heart's in Good Shape, Thanks to Exercise": "Run, Yemelya, It's Your Week"; first two paragraphs are source introduction]

[Text] It seems to us, who were raised in the overcoat of socialist realism, with its shock-worker watches, broad-scale initiatives, and months of every kind—sobriety month, traffic-safety month, model-city month, etc.—that one month was missing—cardiovascular disease prevention month. And now it has burst forth: On the eve of the World Health Day in Kiev, a medical campaign began for the prevention of the "biggest disease of the century." For a month, in the polyclinics, hospitals, and rehabilitation centers of the city, there will be meetings, consultations, and conversations between the leading specialists from the cardiology institute and the Department of Polyclinical Therapy of the Kiev Medical Institute and anyone who wished to avoid infarcts, ischemic heart disease, or cardiovascular disorders.

Our correspondent met with the chief internist of the Health Care Administration of the Kiev Executive Committee and head of the Department of Polyclinical Therapy of the Kiev Medical Institute, V. V. Zboromirskiy, and interviewed him.

[Zakrevskiy] Valeriy Vasilyevich, is it true that any new thing is just something we forgot long ago?

[Zboromirskiy] When it comes to that perpetual toiler of ours, the heart, it is. The heart "remembers" us every second, but we recall it only when it lets us know about itself with sensations of heaviness, crushing, or constriction or with chest pains. But the month is being conducted at the initiative of the World Health Organization. Its motto is "The Beating of the Heart is the Rhythm of Health." And there is a very sound reason for the month—half of all deaths in industrially developed countries are linked to cardiovascular disease.

Since I hear a little skepticism in your question, and some of the readers may harbor some, too, saying that, well, this is just a throwback to pretence, a measure from

those stagnant times just to produce a checkmark, let me note that, for Kiev, the problem has become acute and urgent. The main cause of death among Kievans this past year was circulatory organ disease—it accounted for 58 percent of deaths. Morbidity due to stenocardia and myocardial infarction has risen. And the group of cardiovascular diseases accompanied by temporary disability is one and a half to two times greater in the city than in the republic as a whole.

[Zakrevskiy] Do you associate that with the aftereffects of the accident at Chernobyl?

[Zboromirskiy] It's more that Chernobyl aggravates things, makes the situation worse, but we ourselves determine the general background for cardiovascular disease with our attitude toward health, with how we work, play, and eat, and with how comfortable we are psychologically. Let me remind you that according to WHO [World Health Organization] data, lifestyle accounts for 50 percent of our health, inherited factors and environment account for 20 percent each, and medical science and practice account for only 10 percent.

[Zakrevskiy] You mentioned the group of cardiovascular diseases. What makes that group up?

[Zboromirskiy] The most common among them are myocardial infarction, rheumatic heart disease, hypertension, atherosclerosis, and coronary insufficiency. The latter are combined under the name "ischemic heart disease" [IHD]. Ischemia, both as an acute disease and a chronic disease resulting when the oxygen supply to the heart muscles is reduced or blocked altogether, leads in turn to stenocardia, myocardial infarction, and other damage to the heart. IHD, in particular, is one of the main causes of morbidity and death among the people in most of the economically developed countries. A feature of IHD—one that the statistics on death among Kievans bears witness to—is that in half of all IHD patients, death from myocardial infarction comes unexpectedly, when things otherwise seemed to be alright. But if IHD is being called the "epidemic of the century," then hypertension is an epidemic that's twice as bad. It affects not only the heart, but also the kidneys and the blood vessels of the brain.

[Zakrevskiy] What is the link between blood pressure and mortality rate associated with ischemic heart disease and cerebral insult?

[Zboromirskiy] The most direct link there can be. According to research data, only four deaths per thousand patients were recorded among men between the ages of 35 and 57 with normal blood pressure; whereas that figure was sixfold greater among those with elevated pressure. Cerebral insult occurred 27 times more often among patients with hypertension than among people with normal arterial pressure.

[Zakrevskiy] That means we should do everything possible to lower elevated blood pressure. How can that be done?

[Zboromirskiy] I would alter your question? We should be striving not so much to lower blood pressure as to prevent elevated blood pressure. That means averting it long before drug therapy is required. And doing that is easy and simple: why, the procedure for measuring blood pressure is simpler than boiling a turnip. An annual blood-pressure check is enough for young people. And if, for example, borderline readings are found in a 20-year-olds, be assured that by 40 years of age, one out of every five of them will be seriously hypertensive. That's with the absence of measures to prevent the onset or warn of it, of course. After the age of 35-40, monitoring is necessary—blood pressure should be checked regularly, perhaps every quarter.

[Zakrevskiy] Something that we don't do anywhere...

[Zboromirskiy] That's right. A fourth of the adult population of Kiev doesn't know what its blood pressure is. One out of three Kievans doesn't go for preventive checkups. But blood pressure can—and must!—be measured in polyclinics and medical stations and in the medical units at enterprises. And without that kind of an effort to eliminate "hypertensive illiteracy," we won't get anywhere with the problem. After all, what could be simpler than averting hypertension and performing preventive measures on a timely basis, when 70 percent (!) of the medical care we provide today comes when blood pressure is approaching figures that are more like those of the voltage we use in our electrical systems. So it turns out that the health care sector functions primarily like a fireman, rather than a protector of health.

[Zakrevskiy] And what are the ways to lower arterial hypertension?

[Zboromirskiy] For treating hypertension, preparations of plant origin are widely used: reserpine, raunatin, etc. Which one to use is up to the physician. His instructions have to be followed precisely, and the main thing is to put together a sensible regime of work and rest and to get proper sleep. Let me bring your attention particularly to the use of table salt. Among those who eat salty foods, hypertension is found 16 times more often than among those who don't eat much salt.

[Zakrevskiy] It's well known that atherosclerosis, the basis of IHD, and hypertension are similar in their etiology. Moreover, they have the same risk factors. How can they be avoided, so that cardiovascular disease will not result?

[Zboromirskiy] I often tell my patients and friends whose heart isn't working right, "Get rid of the Yemelyushka syndrome."

[Zakrevskiy] That's the hero of the fairy tale, right?

[Zboromirskiy] Yes, yes, the same one who could say, "By a wave of the wand..."—and the buckets would fill themselves up and go into the passage. That looks nice in the fairy tale to lie on the stove, but in real life it's not so much that the kalatches won't get baked, but that you

can send yourself to the grave. Doing nothing, or call it "couch therapy" (I call it the Yemelya syndrome, but in medicine they call it the hypodynamia syndrome), has a damaging effect on the heart and the blood vessels. Especially if one has a sedentary lifestyle, or smokes, or has an unbalanced diet. Here's my prescription, it's very simple: surround yourself with a hundred doctors and take a hundred tablets a day, and they won't be able to do anything for you if you don't get any exercise, if you don't get rid of the extra weight, if you don't stop smoking and looking to the bottle all the time.

[Zakrevskiy] You haven't said anything about stress.

[Zboromirskiy] From my own experience, I've found that what stresses us most are the magic words "I've got to get it done." And when we don't get it done, "our heart fills with blood," we "get angry," and we can make a mess of things. Here's my advice: if you see that a situation can't be changed, then change your attitude about it. Change it once and for all and quietly. Remembering that hurrying has to be done slowly. And also remember this: it's not always important what we say—sometimes it's more important how we say it! Being the master of our tone, of the intonations in our voice, of our character, finally, is not always easy, of course, but it's very necessary. So if you feel yourself under the hammer of nervous stress, I recommend this: go for a walk in the park, run to the stadium, do some physical labor. Regular exercise, which is good for the muscular, cardiovascular, and nervous systems, including its subcortical (unconscious) level, is the best medicine for mental stress. If stress assumes the role of an executioner who tears the heart to pieces, then exercise is the noble redeemer who moves the hand of the executioner from its victim.

[Zakrevskiy] Last question, Valeriy Vasilyevich. Can our readers get more specific recommendations for specific things?

[Zboromirskiy] Yes, of course. For that, they need to call the "health service" during working hours on the city telephone lines. The number is 0 83.

### Russian Medical Aid to Tiraspol

927C0540D Moscow ROSSIYSKAYA GAZETA in Russian  
3 Jul 92 p 6

[Article by Andrey Shitikov: "Medical 'Landing'"]

[Text] Medications worth more than 4 million rubles were sent free of charge to hospital in Tiraspol as a result of a special expedition of the Russian State Committee for Emergencies.

But the purpose of that expedition was not limited to just the delivery of badly needed medications to the combat zone. Flying into Tiraspol along with the State Committee specialists were medical personal of the mobile field hospital Zashchita [Protection], staff members of the Institute of Biomedical Problems, and physicians of the Russian Center for Emergency Medical Care.



After studying the situation, the specialists on the expedition, who have a great deal of experience in organizing massive aid to victims, and the administration of the city health department of Tiraspol identified the best points for staging the wounded, how they would be sent to the various treatment facilities, and what the evacuation routes would be. For rendering highly qualified medical care, surgeons from the Russian Center for Emergency Medical Care, headed by Prof. B. Varava, were immediately sent to the city's hospitals.

### **American To Open Plastic Surgery Center in Moscow**

927C0540E Moscow NEZAVISIMAYA GAZETA  
in Russian 9 Jul 92 p 6

[Interview with Enoch Chamby, an American surgeon who plans to open a plastic surgery center in Moscow, by Marina Levashova, under the rubric of "Medicine": "Beauty Comes From God, or a Surgeon: The Americans Want To Open a Plastic Surgery Center in Moscow"; first two paragraphs are source introduction]

[Excerpts] American professor Enoch Chamby, a surgeon with 20 years of experience, plans to open the Center for Plastic Surgery in Moscow. Special equipment has already been delivered to the Russian capital. Right now, negotiations are under way with a number of medical and commercial organizations that are interested in implementing the project. As Prof. Chamby says, the opening of the center is a matter of literally several months.

"You have marvelous specialists, and we have suggested that many of them go through special training in the States," Chamby reported to our correspondent. [Passage omitted]

[Levashova] Your operations in the United States cost \$1,000-20,000. Certainly, not everyone in Russia will be able to go to the Center for Plastic Surgery for help.

[Chamby] Many operation in the States, we do for free. That applies, first of all, to children with congenital deformities—with a hare lip, for example—children who have been in accidents. That practice of free care we want to bring to Russia. I'm aware of the fact that after Chernobyl, there were a good many such unfortunate children born in Russia, Belarus, and Ukraine.

We don't intend to multiply the dollar by rubles—our operation will have an average cost of about 3,000 rubles. The purpose of opening the center in Moscow is not to make money. We want to create a joint Russo-American program whose principal area will be research in the field of plastic surgery and the development of new, effective technologies. We plan to invite leading American specialists to Moscow to give lectures. I think—and I believe this—that Moscow should become an international science center in this field. [passage omitted]

### **'Phillips' Scandal Jeopardizes Reconstruction of Hematology Center**

927C0540F Moscow NEZAVISIMAYA GAZETA  
in Russian 9 Jul 92 p 6

[Article by Dmitriy Frolov, under the rubric "Current Affairs": "Russian Health Minister Jeopardizes Hematologists: From All Appearances, He Himself Doesn't Want That"]

[Text] When you consider that Andrey Vorobyev, while health minister, is also the director of the Hematology Science Center, the situation may seem paradoxical. To the staff members of the Center, however, such a turn of events, although very annoying, is also reality. Upset about it, they are linking the current, complicated situation in which the minister finds himself—in addition to other ills of his sector, he has produced a lack of trust on the part of the medical workers union—with the future construction of a new building for the Center.

Today, the hematology center—with its research and therapy subdivisions, its department for marrow transplantation, and its blood service—is located in buildings that are far from advanced, and the center represents a case typical of domestic medicine (its best side, needless to say) in which world-class results are achieved in conditions that don't come close to being world-class conditions. It is absolutely clear that there is practically only one way to somehow bring those conditions up to world standards—to build and equip exclusively with the help of Western firms. Needless to say, doing that has been possible if extremely high posts were filled, the oncology and cardiology centers providing incontrovertible evidence and a clear example of that.

As for the hematologists, such prospects arose for them somewhat before the director of the Center became health minister: In October 1991, the project associated with a contract with the German enterprise Robotron Anlagenbau GmbH [Robotron Anlagenbau GmbH] appeared regarding renovation, construction, and outfitting "from start to finish" for 90 million German marks, which were reserved especially for that purpose by the Hermes Insurance Company from monies presented by a consortium of German banks to secure exports from new lands. The conclusion of the contract depends on credit-return guarantees made by the Russian government, for which the project must be included in a priority list of Germany's credits, the total of which is 5 billion marks. The minister did not consider it convenient to sign with his own hand a letter about that addressed to Yegor Gaydar, and it was sent to the government for the signature of the deputy minister, Bella Denisenko.

That document makes not only the development of the country's hematology service, but also the control of the threat posed by hepatitis and AIDS, as well as the execution of a national program for dealing with the effects of the Chernobyl accident, dependent on a positive resolution of the question.

It is entirely probable that those who, outrightly or in a hidden manner, have ill will toward the health minister will be able to interfere with the execution of the project involving the renovation of the Center by using the scandal surrounding the disposition of the contract with the Phillips firm (see NEZAVISIMAYA GAZETA, No. 121, 27 June 1992), the credit for which was expected to come from those 5 billion marks of the consortium German banks. As we know, that contract, for the creation in Russia of production facilities for the manufacture of medical equipment, was halted by Andrey Vorobyev, who announced that Phillips is proposing to build for us obsolete models, with technologies that are not advanced, and, on top of it all, for an exorbitant price. Notwithstanding virtually any outcome of the conflict, he will run into difficulties: Even if experts prove that the contract was concluded not in our best economic interests, the Russian side will still have to pay large amounts as a penalty, and for that reason, Andrey Vorobyev shouldn't expect any laurels. Judging from everything, he was prepared for that upon agreeing to accept the minister's portfolio, being well aware of the situation in health care as an insider, so to speak. That step surprised many of his colleagues because Vorobyev, a prominent scientist and clinician who is also very well-respected abroad, did not, in their opinion, need any confirmation of his own achievements in that manner.

"It was a suicidal act dictated by a romantic notion of duty," says one staff member close to the academician.

And maybe it is just that, in which case it is very probably more evidence that such an approach is often thankless. And unfortunately, not just for the minister himself.

### Commission Studies 'Farmatsiya'

927C0540G Chita-tsentr ZABAYKALSKIY RABOCHIY  
in Russian 11 Mar 92 p 2

[Article presents the results of an inquiry by N. Kochizhov, chairman of a commission appointed by the head of the oblast administration to study the Farmatsiya Production Association, and commission members B. Zaks, S. Bednyakina, N. Chudnenko, L. Brodyanskaya, A. Chipizubova, V. Sizonenko, S. Shvydkaya, and N. Zhambalov: "Inquiry: On the Results of the Verification of the Reliability of Information Presented by Reporters in Newspapers and in Radio and Television Reports on the Work of the General Director's Office of the Farmatsiya Production Association"]

[Text] Verification of the information presented in the article "The Firm Isn't Just Making Brooms" (ZABAYKALSKIY RABOCHIY, No 29, 13 February 1992) was conducted from 18 February to 26 February by means of an analysis of the existing documentation and reports in the director's office of the Farmatsiya Production Association, in the pharmacy warehouse, in the oblast health department, and in treatment and pharmacy facilities.

On the merits of the information presented in the newspaper, the commission established the following:

**1. The assertion of journalist V. Mikhaylov that "many city residents have gone to the other world" as a result of a lack of the proper amount of medicines on pharmacy shelves in terms of assortment and volume.**

The mortality rate in December 1991 was actually higher than it was in same month of previous years... There was somewhat of an increase of acute respiratory disease among the oblast's population in the winter period, as compared with the same period of previous years. The largest outbreak involved influenza in January—as many as 16,100 people came down with it. In terms of number of individuals with influenza, the peak came during the period of 3-5 January. At the same time, official health care agencies refused to say that the mortality rate among the population increased as a result of a shortage of medicines in the pharmacies and treatment facilities.

Specialists of the epidemiological department of the oblast center for health and epidemiological inspection do not feel that the influenza can be tied to the lack of any given medicine in terms of when individuals became ill or how many of them became ill. An individual's becoming ill depends on the individual's immunity, on the form of influenza, and on conditions such as weather conditions and social conditions. The availability of drugs, however, in terms of assortment and volume does facilitate rapid treatment of influenza-related illnesses.

**2. The assertion that the shelves "are crammed with drugs" in the pharmacy warehouse.**

According to existing norms, 1 sq m of warehouse space is required for the turnover of goods worth 965 rubles [R]. Turnover in 1991 represented R21 million, which should correspond to 13,230 sq m of space; the actual floor space of the warehouse premises, however, is 5,670 sq m, i.e., 43 percent of what is needed...

Based on the above data, one can conclude the following: The only way warehouse spaces will not be "crammed" with drugs is if floor space is increased twofold or if the normative surpluses are cut twofold, which would jeopardize the supply of drugs to pharmacy and treatment facilities.

**3. The assertion that "there is absolutely nothing to disinfect premises."**

In 1990, the warehouse received 2.55 tons of chloramine. Some 2.44 tons were sold to pharmacy and treatment facilities. In 1991, a total of 9.0 tons were received. A total of 7.1 tons were sold. As of 1 January 1992, there were 2.0 tons of chloramine at the warehouse—for birthing facilities.

Moreover, the warehouse has sufficient quantities of other disinfecting agents that are released upon request to treatment and pharmacy facilities.

As for "several tens of tons of chloramine," 40 tons of chloramine arrived from Dzerzhinsk on 28 December 1991 to accommodate delivery of product to the joint

venture Fiton. The bill for payment (i.e., the document from which it was possible to determine the price) arrived on 23 January 1992. On 8 February, the chloramine was shipped out to enterprises according to schedule.

The commission has no grounds for prosecution of the Farmatsiya Production Association with regard to the chloramine. Moreover, the availability of that disinfectant in the oblast over 1991 and the beginning of this year has improved.

**4. The assertion involving its supply of "its own" pharmacies with more drugs than it supplies "other" pharmacies.**

The commission did not find any confirmation of that information. Spot checks of the delivery of drugs to pharmacies of the city of Chita show that a number of "other" pharmacies received more drugs than did Farmatsiya's pharmacies.

**5. Talk and assertions about prices: drugs going to "other" pharmacies at prices triple the regular prices, at commercial prices, etc.**

The mechanism for price formation consists in the pharmacy warehouse acquiring medications from suppliers at agreed-upon wholesale prices. Those prices are regulated by the RSFSR Ministry of Health. The medications are sold to pharmacies at those very same prices. The pharmacies set retail prices for the goods by raising the price 25 percent...Thus, with the medications remaining allocated and the prices regulated, all pharmacies receiving drugs will be in the same position.

**6. The assertion of a delay in the distribution of drugs arriving at the warehouse as humanitarian aid.**

The delay involving the drugs coming to the warehouse as humanitarian aid was the fault, in the opinion of the commission, of the workers of the warehouse and, to some extent, the oblast health department, because the delivery schedule set up by the deputy head of the oblast health department, G. A. Fedorova, and the warehouse was not adhered to, and the oblast health department wasn't even informed of subsequent arrivals. The head of the warehouse, stating that there had been a verbal ban from the deputy director of the Farmatsiya Production Association, Z. I. Sycheva, could not confirm that, because she had not appealed the ban (if there were one) to the oblast health department or the oblast administration.

In the general director's office of the Farmatsiya Production Association, there are no documents from the warehouse informing the officials of the presence of humanitarian aid.

Nor are there sufficient grounds to assert that "isoptin tablets are a panacea for heart problems," because medical specialists (the chief cardiologist and others) refused to confirm that officially.

**7. The commission confirms that workers of the pharmacy system of the oblast are poorly informed about the forms that will be taken by the impending reorganization of the Farmatsiya Production Association.**

Although a session of the council of directors was held on 6 December 1991, only 19 people attended. The session examined, mainly, aspects of the operation of the pharmacy warehouse. But a meeting with the municipal association of pharmacists was held on 9 January, i.e., two weeks before the signing of the decree on the formation of the firm Farmatsiya. The project was not coordinated properly with the municipal administration or health care agencies.

**8. On the surplus of vitamins at the warehouse.**

The children's vitamin Pikavit. Received on 24 October 1991 (1842 packages of lozenges, 1785 bottles). Surplus as of 1 February 1992: 1053 lozenge packages, 1785 bottles). Releases: Agina pharmacy, warehouse, 450 packages; Fiton, 150 packages.

The children's vitamin Taksofit No 10 arrived on 14 February 1991: 5,800 bottles. Surplus as of 1 January 1992: 2836. Distributed: 185 to Fiton, 750 to warehouse; to Aksha, pharmacies No 66, 2.

The children's vitamin Unicap [Yunikap] arrived on 31 January 1992: 112,000 packages. A total of 1,960 were released to Fiton, and the rest were still in surplus as of 1 February 1992.

There is no reason to require that they be sold immediately, because there are plenty of other vitamins at the warehouse that are also being sold. The general director's office at Farmatsiya planned their sale to children's facilities in the spring. A distribution of those batches to the entire population through the pharmacy system would have no effect on the elimination of avitaminosis.

**9. Drug sales, surpluses, and the ban on sales in December and January.**

Intrasystem turnover at the warehouse for 1990 was 113 percent; for 1991, 130.1 percent; and for the fourth quarter of 1991, 149 percent.

The list of vitally needed and important drugs was adequate. Kefzol is an antibiotic. As of November 1991, its surplus was 3,710 t [not further expanded] bottles; as of 1 December 1991, the figure was at 2,435; as of 1 January 1992, at 1,809; and as of 1 February 1992, at 1,780. Remantadine, the influenza drug, was in surplus as of 1 November 1991 at 6,203 packages; as of 1 December 1991, at 3,416; as of 1 January 1992, at 2,034; and as of 1 February 1992, at 1,825.

There are also groups of drugs for the treatment of cardiovascular diseases, gastrointestinal diseases, rheumatism, fevers, and acute respiratory diseases. Virtually all of the stocks allotted in 1991 were received.

A comparison of the surpluses of two of the above drugs refutes the assertion that virtually no drugs were released in December and January. In addition, there is evidence that drugs were "held back" at the warehouse. Constraints on the release of goods from mid-December to mid-January are confirmed. Only emergency requests were filled. The reasons are rather sound:

- concern among the public caused by the drug shortage and the impending rise in prices, plus profiteering on the market, already existed
- there was an effort to maintain surpluses and reserves of goods, because there was reason to believe that the receipt of goods in 1992 would be smaller yet

**10. A check of the sales of 50 very scarce drugs did not find that pharmacies had been separated into "ours" versus "others," with the exception of one instance, in which pharmacy No 66 Flora was issued six types of vitamins for its opening.**

Of 40 drugs that we checked and that were released to pharmacy No 110, no improper distribution was found, i.e., there was no "punishment of the obstinate." With regulation No 9, dated 27 January 1992, the Farmatsiya Production Association inserted changes in the outpatient and hospital coefficients for pharmacies Nos 132, 77, and 110 in connection with the attachment of the oblast clinical hospital to the drug supply of pharmacy No 132.

Pharmacy No 110 kept its previous hospital coefficient of 1.8, and its outpatient coefficient dropped to 1.8 from 2.1.

#### Conclusions:

1. The commission, on the basis of the analysis of the documents and statistical reports, considers the assertions of the journalists to be unfounded with regard to the following:

- that pharmacy No 110 was punished for being "obstinate" by being sold a smaller volume of drugs
- that Farmatsiya's "own" pharmacies have advantages over "other" pharmacies in terms of the supply of drugs
- that drugs arriving at the warehouse as humanitarian aid were not sent to treatment facilities and other facilities because of a ban by the general director's office of the Farmatsiya Production Association
- that drugs are going to or will go to "other" pharmacies at "triple the price"
- that there are no disinfectants
- that the warehouses are "crammed" with drugs
- that imported vitamins need to be urgently put up for sale

2. The commission does not have data to confirm or deny the assertion of journalists that many city residents died as a result of the drug shortage. No one in the oblast has done that kind of analysis yet.

3. The commission does not find it possible to tie the number of influenza illnesses and the time of the greatest number of illnesses to the availability of drugs in terms of volume or nomenclature.

4. The commission confirms that the Farmatsiya Production Association did violate the principles of glasnost, of holding discussions among the workers, and of the need for coordinating with the antimonopoly committee and the municipal administration in reorganizing the network of pharmacy facilities and forming the Farmatsiya firm.

5. A study of documents and surpluses of goods at the pharmacy warehouse shows that the Farmatsiya Production Association does have, at this moment, needed and extremely important medications.

#### Recommendations:

The commission, for the purpose of preventing further collapse of the system for providing the oblast's treatment facilities and the public with drugs, recommends the following:

1. The Farmatsiya Production Association should regularly inform the specialists of the oblast health department of the availability in the oblast of drugs, on a drug-by-drug basis; should explore the possibility of selling medications to the oblast clinical hospital directly from the warehouse and establishing coefficients for the sale of medical goods to pharmacies and treatment facilities from among those that are allocated; and should be guided primarily by the decision of the oblast health department.

2. Officials of the health care agencies of the treatment and pharmacy facilities should refrain from making categorical assessments of the correctness of the formation of the Farmatsiya firm and from acting in accordance with such assessments until the question has been decided in the manner established by law.

3. In order to inform the public of the true state of affairs with regard to the availability of drugs and the reorganization of the pharmacy service, the commission feels it necessary to hold a televised meeting (a "roundtable") that includes the members of the commission and representatives of the oblast health department, the Farmatsiya Production Association, the strike committee, and treatment facilities.

#### Officials Discuss Pharmaceutical Supply Problems

927C0540H Chita-tsentr ZABAYKALSKIY RABOCHIY  
in Russian 11 Mar 92 p 2

[Article consists of discussion led by ZABAYKALSKIY RABOCHIY correspondent Viktor Mikhaylov and involving B. Sormolotov, first deputy head of the oblast health department; V. Yakovlev, chief physician of the oblast clinical hospital; I. Shurinova, chief oblast internist; V. Vishnyakova, chief oblast nurse; T. Domysheva, general director of the Chita Municipal Pharmacy Enterprise; L.

Suturina, head of the pharmacy warehouse; L. Aleksandrova, chairman of the strike committee of the city's pharmacies; and T. Litvintseva, chairman of council of pharmacy workers: "Roundtable' Meeting"; first two paragraphs are source introduction]

[Text] As already reported, a meeting with specialists took place in the editorial offices, and it was devoted to the state of affairs involving the supply of pharmaceuticals to the residents of the oblast at the end of last year and the beginning of this year. The reason for the discussion was provided by the official document titled "Inquiry," which is presented here to the readers. It has already been cited in Chita radio and television broadcasts, and a satirical article based on it, "Prikol" [tie post] has even been put together and published in the newspaper KOMSOMOLETZ ZABAYKALYA (5 February).

Although the title of the document announces the verification of the reliability of facts revealed in many sectors of the mass media, the "Inquiry" cites and refutes our newspaper's article "The Firm Isn't Just Making Brooms" only. In order to "dot all the i's and cross all the t's," ZABAYKALSKIY RABOCHIY invited all interested parties to the discussion. Taking part in the discussion were B. Sormolotov, first deputy head of the oblast health department; V. Yakovlev, chief physician of the oblast clinical hospital; I. Shurina, chief oblast internist; V. Vishnyakova, chief oblast nurse; T. Domyshva, general director of the Chita Municipal Pharmacy Enterprise; L. Suturina, head of the pharmacy warehouse; L. Aleksandrova, chairman of the strike committee of the city's pharmacies; and T. Litvintseva, chairman of council of pharmacy workers. Representatives of the Farmatsiya Production Association, unfortunately, did not respond to our invitation. The chairman of the investigating commission, N. Kochizhov, citing a prohibition by the leadership, did not come, either, although he wanted to.

#### Once Said, A Word Can't Be Taken Back...

The bewilderment and resentment among the participants of the meeting stemmed not only from the absence of [the Farmatsiya representatives and the commission members], but also from the way the commission was formed. The consensus was that, for the sake of objectivity, the commission should have at least included representatives of the Chita Municipal Pharmacy Enterprise.

It should be noted that in the course of the commission's work, the members did not contact the editorial offices of ZABAYKALSKIY RABOCHIY to determine where the facts in the article came from. They based their report on the results of the audit performed by specialists and pertinent agencies. And they are rather free about taking liberties with the article "The Firm Isn't Just Making Brooms," pulling words and phrases out of context and sometimes giving them a meaning that was completely different from the original. For example, in investigating the state of affairs regarding the shortage of space in the pharmacy warehouse, the commission did

not refer to the fact that that shortage was mentioned in our article, too. And here's what some of our panelists had to say about the fact that the warehouse is "crammed" with drugs...

[Suturina] *I've worked at the warehouse for three years now, and there has never been such an excessive inventory build-up as there was in December and January. The fire department even made certain demands of us regarding that on 25 January. We began to ship the pharmaceuticals out steadily after the articles in the press. Even though pharmaceuticals for the pharmacies are still in the corridors. By the way, 30 percent of the warehouse space was occupied by goods for the joint enterprise Fiton.*

[Aleksandrova] *The whole thing is that, in fact, for the last three years, Farmatsiya has not been involved at all with the development of the pharmacy warehouse.*

The sense of the article on other points was also distorted in the "Inquiry." Specifically, the respected commission was running on idle when it was verifying the "assertion" of the journalist that drugs go to "other" pharmacies (i.e., those that are not planned to be transferred to the state commercial firm that is being created, Farmatsiya) at prices higher than those charged to "our own" pharmacies. Well, excuse me, but that was never "asserted" in the article. The head of the city administration, R. Gennatulin, said that as merely a forecast of the future, and we quoted him.

And as for delays in the distribution of humanitarian aid, the article presented two points of view—that of the workers of the pharmacy warehouse and that of R. Shagayeva herself, who anticipated the conclusions of the commission and blamed the oblast health department. By the way, to this day it's still not clear what caused the gifts from abroad to be "slowed" en route to the consumer.

[Sormolotov] *The commission notes in the "Inquiry" that both the oblast health department and the warehouse are at fault. I disagree completely. On 24 September 1991, the warehouse gave us information on the arrival of humanitarian aid, and on 11 October we sent them a schedule. Where did that document "wander off to"? Why did the medications sit around? Why weren't they distributed? I can't answer those questions.*

*In the future, I think aid should be addressed directly to health care enterprises, with the pharmacy transfer component being used.*

*And about the humanitarian-aid isoptin tablets for heart patients, which became a subject of the commission's attention, the medical people said this: "It may not be a panacea, but it's a very good, very necessary drug."*

#### You Can't Buy Health

That age-old truth, the participants of the meeting did not question. Although they were, in fact, surprised at the conclusion of the commission that the influenza, in



terms of when it broke out and the number of people who came down with it, couldn't be linked to the lack of drugs and that we have to count on the individual's immunity, on the weather, and so forth. At any rate, the link was never asserted in the article. The article merely stated a fact: there's influenza, and the drugs are at the warehouse. The assertion in the article that, because of the shortage of drugs in recent years, "many city residents have gone to the other world much sooner than the times that medicine could have assigned them" (in the "Inquiry," everything had to do with the death rate in just December) was also something that the participants didn't particularly dispute. After all, today's shortage of tablets, pills, and mixtures could show up not now, but later, having an effect on the life span of people.

The chief oblast internist, I. Shurinova, noted that people who suffer with chronic diseases are the ones being "hit hard" by the drug shortage. They have to keep taking medications on a regular basis, and the slightest interruption can affect the patient's condition.

[Yakovlev] *Last year, particularly because of the shortage of disinfectants, surgeries were down in the oblast clinical hospital. Fewer patients were operated on, and the usual volume of work wasn't done. Of course, that didn't improve people's health... And after the article appeared in the ZABAYKALSKIY RABOCHIY, the supply of materials to the hospital improved. Right away, we got 300 drugs. In December and January, they had been arriving on a limited basis.*

The workers of the warehouse assert that Farmatsiya officials had verbally banned the shipment of drugs from the warehouse to pharmacies. The truth of the assertion was confirmed in the testimonies of 13 witnesses given to the oblast prosecutor. The "holding back" is confirmed in the "Inquiry." At the same time, statistics are given for two drugs, and on the basis of those statistics the commission refutes the assertion that "virtually no medications" were released. In fact, if you use the figures cited in the inquiry to perform some simple arithmetic operations, you will find the following: in November, 1,275 bottles of the antibiotic kefzol were shipped out, in December just 626, and in January only 29! The influenza drug remantadine (remember, the outbreak of influenza, as noted in the beginning of the commission's "Inquiry," was in January) was shipped in a quantity of 2,787 packages in November, a little less—1,382—in December, and 209 in January!

Of course, I must take the blame for any inaccuracy in my work. Which I am doing: Please be generous in forgiving me—some drugs were, in fact, released. But were they released in the volumes needed for an epidemic of influenza and acute respiratory disease?!

Here's what the participants of the meeting said about the supply of drugs.

[Domysheva] *The surplus of goods at the end of 1991 in the pharmacy system of Chita should have been, according to plan, some R6,570,000 worth, but it turned*

*out to be half that because of the ban—R3,049,000. For example, over the entire fourth quarter, pharmacy No 110 received only R186,000 worth of product. But when they started shipping the drugs, it received R208,000 in February alone. Those data are in production cost prices.*

And what was the situation in the treatment facilities regarding disinfectants?

[Yakovlev] *Of the two tons of calcium hypochlorite requested by the oblast clinical hospital for six months of 1991, we got only 600 kilograms. And instead of two tons of chloramine, we got 45 kilograms.*

[Vishnyakova] *The supply of chloramine did actually improve in 1991. But we have to use three times as much now, so as not to duplicate the situation with regard to the spread of AIDS that occurred in Elista, Volgograd, and Rostov... And to solve the problem, the nurses had to buy disinfectant in stores. They started using soda.*

*But chloramine is only one disinfectant. There are also others at the warehouse—hypochloride and calcium hypochlorite. There's no particular shortage of the first, but it's very bad for the instruments, medical workers get sick from it, and patients have allergic reactions. The calcium hypochlorite is no good for treating instruments. We need Perhydrol, which escaped the attention of the commission.*

*Meanwhile, the hospital workers are scraping by as best they can. By the way, chloramine has now begun to arrive. But some of it has expiration dates that have already passed. It's less active. Apparently, it was kept at the warehouse in the "reserve" the commission mentioned. It's a pity—we're looking for it everywhere, and it's just sitting around.*

The meeting's participants also had questions for the commission about the distribution of vitamins. But there was nobody to answer them. And there was also nobody to argue with about the problem of avitaminosis.

Also unanswered was the question in the inquiry of the specialists assembled in the editorial offices as to what the regular supply of imported vitamins to the joint venture Fiton could be attributed to.

#### 'Ours' Among 'Others,' and 'Others' Among 'Ours'

The commission seemed to devote most of its investigation to examining the problem of "our" pharmacies versus "other" pharmacies. All the claims, in the end, were pronounced unfounded. So was there such a distinction, or wasn't there? I won't begin to say a word about it—I'll just give the floor to the specialists.

[Litvintseva] *There was. There's a pharmacy No 66 Flora, which was to be a part of the state commercial firm Farmatsiya. A check of things showed that in December, it got deliveries of various goods—festal, broncholytin, Zelenin drops, corvalol, tincture of valerian, tincture of eucalyptus, and so forth. The deliveries are confirmed by the existing copies of the invoices.*



[Domysheva] *In January, 1,000 packages of pentalgin were shipped to Flora, 40 packages of festal, 400 packages of sedalgin, 1,120 packages of Unicap [yunikap] vitamins, 10 bottles of insulin, 120 bottles of broncholytin, and 216 bottles of Nospani [anti-spasmodic].*

*I would note that that pharmacy is a specialized pharmacy, which is reflected in its name.*

In a similar manner, what was said at the meeting in the editorial offices about the "punishment" of pharmacy No 110 doesn't jibe with the conclusions of the commission. The article "The Firm Isn't Just Making Brooms" mentioned the order of R. Shagayeva to lower pharmacy No 110's outpatient coefficient to 1.8 from 2.1. That is, deliveries to it of medications issued by prescription in the polyclinics were cut back by one-seventh.

[Domysheva] *In the order, it said that the coefficient was lowered because of the fact that...the supply of the oblast clinical hospital went from pharmacy No 77 to pharmacy No 132. But what does that have to do with No 110, which serves the population of the Chita rural rayon and the microrayon Severnyy and other places? No explanations have been offered at all.*

#### Isn't It Time to Do Something?

The participants of the meeting noted that the public's attention switched from the problem associated with the creation of the state commercial firm Farmatsiya to the investigations of the drug supply. ZABAYKALSKIY RABOCHIY purposely stayed away from that subject, because there will be a trial involving the oblast prosecutor and the oblast administration regarding the legality of the creation of the firm.

"Let the appropriate agencies look into the matter," noted I. Shurinova, chief oblast internist (and you can't help but agree with her). "And it's apparently not worth searching any more for a compromise in one direction or another. I think all parties concerned need to finally get together and, on the oblast and city levels, solve the problem involving the drugs. After all, the quality of life of the Baykal people hinges on it. We have natural resources and products made by enterprises, and they can be used for barter, in the interests of primarily the consumers of the medications—the medical people and their patients.

#### New Medical Center in Murmansk

927C0540I Murmansk POLAYARNAYA PRAVDA  
in Russian 19 Apr 92 p 1

[Article: "How a European Standard Can Survive With Russian Funding"]

[Text] Every time I go around the offices of the oblast diagnostic center with some doctor, I become like a country bumpkin to whom they tell things and show things and who then wants to pester everyone by saying, "Wow, you wouldn't believe what I saw there!"

But I think other doctors find themselves in a similar state when they're here, because the center has equipment that is unique for oblast health care, and there are research techniques here that are known only to curious doctors who go through the special literature. In fact, there are only 19 such centers for all of Russia.

I could write an encomium right now! It would recall how just four years ago, Dr. Cheketa, unrolling the plans on the table, reading aloud paragraphs from the instructions, explained what it would be like, the center. From time to time, I would insert into the conversation, "You think they'll allot money for it, and you hope to get it?"

And now, Gennadiy Ivanovich sits in a new office, with a computer at his fingertips, and all he has to do is punch a key, and it tells him immediately who and from what city or settlement has an appointment with what consultant, who specifically a specialist is seeing at any given moment, what procedures are being used...Why, that computer has absorbed an awful lot into its memory over the first years of operation of the center—which consists of two buildings filled to the brim with the newest instruments, all imported.

Cheketa's office is also modern. Not stiff, though. Cheketa is still impetuous and indefatigable. But he doesn't smoke anymore. I don't think he would have quit, despite the medical information about the harm nicotine does, had not unpleasant heart problems developed when the center was being built.

"Basically, I'm satisfied. The center has been built just as I had imagined it to be. And a very professional staff has been put together—a team of like-minded people. The maintenance service is good. Even the sanitary engineer. You know, I never in my life saw a sanitary engineer who wasn't—I hope they all forgive me—a drunk or a fool. But the one here is a good fellow. Our labor has been organized well. We're paying people's wages, and every little thing is taken into consideration, so that we can then pay fairly. It's another matter whether procedures are evaluated properly. Right now, they're very inexpensive by comparison with life today. No, it's a genuine pleasure to work here. If only..."

Let's wait a little with the "if only's" that the chief physician is ready to enumerate. The newspaper has already reported about the center that earns money. But it's worth saying again that it's the doctors and the patients who need modern, profound diagnosis who have received the wealth. At the center, they can study our body with about 400 different techniques. Telling you about them all—induced by the country bumpkin—would be interesting, but impossible. Let me take just one component—the laboratory. And even it has a clinical department, a biochemistry department, and an immunology department.

All the biochemistry blood analyses in Murmansk are not done here, but with a speed and in a volume that couldn't have been achieved before. And on an advanced level. The standard of the parameters is very fine, and it

is automatically calculated and varies with the age and sex of each individual being tested. And if the analyzer shows some pathology, then the lab technician herself orders additional tests right there, that is, asks the analyzer new, clarifying questions. That is so that the doctor will receive more information about the patient and can reach an accurate diagnosis more quickly.

But the most extraordinary thing, in my humble opinion, happens on the immunological blood analyzers. They record any deviation in the endocrine system and interpret in detail the immunological status of the body. Oncologists have been waiting in anticipation for those tests.

Every cancer has its own marker. Test systems can detect cancer cells even in the hidden, latent period (which can last for years), they can quantitatively determine the concentration of the cells, and they can give a prognosis about how long the patient will live or what the course of his disease will be. The laboratory has four markers—for breast cancer, prostate cancer, ovarian cancer, and gastrointestinal cancer. And if they manage to purchase 20?

### **Radiation Center Planned for Bryansk**

927C0540J Moscow TRUD in Russian 24 Apr 92 p 3

[Article by V. Prokofyev, Paris: "Doctor Chekhov-Botkin Practices in France and Wants to Help Russia"; first paragraph is source introduction]

[Excerpts] I became acquainted with Sergey Petrovich Chekhov-Botkin in Paris, during a meeting between Boris Yeltsin and Russian emigres. Our chat back then was pitifully short, and we agreed to meet later. The grandson of the legendary founder of Russian medicine is an unusual person. A first-class surgeon, a hero of the Resistance, and a passionate propagandist for the coming together of France, where he is a citizen, and the Russian state, in the depths of whose valiant history are his family roots. [passage omitted]

You would think that in his declining years, Sergey Petrovich could get some rest. But this indefatigable French citizen is Russian to the bone. Back in 1987, Botkin's grandson was ready to outfit one of the hospital buildings in Moscow with the newest French equipment.

Then the doctor "lobbied" the big construction magnate Buig to build a guest and hospital complex filled with super equipment, in Georgia. The French would pay for it in hard currency, and the local authorities would pay in rubles. And again, it turned out that nobody seriously needed that.

Another would probably have despaired. But Sergey Petrovich didn't give up. Patience, understanding, and a readiness to forgive and forget the "negative"—aren't those qualities drawn from the Botkin precepts? Or maybe it's the genes of the glorious Russian artillerymen, who weren't used to giving up or attaching any power to it? Whatever the case, Dr. Chekhov-Botkin has not lost his soul and believes in the Russian level of mastery. In St. Petersburg is a military enterprise that, in the context

of conversion, is creating endoprostheses from lightweight, super strong alloys—protheses of hip joints, elbows, etc. They would gladly buy them in France.

At the same time, the doctor is organizing training of the undergraduate students and graduate students from Russia in Parisian institutes and clinics. Sergey Petrovich was chosen as a member of the Russian Academy of Technological Sciences, whose interests he represents in France.

"In a number of areas," he says to me, "you have gone much farther ahead. We have to break the image in the West of Russia being backward. Russia is a powerful science power."

Dr. Chekhov-Botkin's main concern today is the design of a center for radiation medicine in Bryansk. Called upon to study the effects of the Chernobyl accident and to render medical care to the victims, the center should be built under the aegis of the World Health Organization and UNESCO. The project is represented by the French company Buig. Local banks bonded by the French government and the European Bank of Reconstruction and Development, have agreed to back it with loans completely. A year ago, the project, with all the corrections, was sent to the Russian specialists; and last September, the then-minister of economics, now French prime minister, Pierre Bérégovoy confirmed the support of the French government during a trip to Moscow. He spends a lot of time there now. Why? [passage omitted]

### **Academician on Infant Mortality, Health**

927C0541A Moscow OGONEK, in Russian No 18-19, May 92 pp 15-18

[Article by Vyacheslav Tabolin, Head of the Department of Childhood Diseases, 2d Medical Institute, Vice-President of the "Children of Russia" Association, under the rubric "Life": "Don't Extinguish the Spark of Life"]

[Text] I will not explain why the problem of child mortality goes far beyond the boundaries of medicine. Everyone knows that this an indicator of a country's well-being or malaise. And I, a pediatrician, wish that the Russian government and our peoples' deputies were aware of this. Pediatrics, in this harsh period of the country's transition to the market, deserves greater attention and greater assistance on the part of the state. It cannot simply be placed on a commercial basis. And, by the way, that is something that does not exist in any country. In this we should not be "first in the world".

I will turn to statistics. In 1913, 277 out of a thousand children died. In the 1970's, 25. It would seem that this is a lower order of magnitude. But soon the curve crept upward and reached 28 fatal cases per thousand children. The ruling comrades became agitated, and... covered up the statistics, classified them. We are now harvesting the fruits of this step.

Doctors have long understood that everything was far from fine in pediatrics. I remember the pain with which

my teacher, Georgiy Nestorovich Speranskiy, an Academician, the country's Chief Pediatrician, complained to me: "I can't understand anything. All my proposals disappear somewhere in the sand. They are breaking up the well-thought-out, effective system of pediatric consultations; they are not allocating resources; and needed equipment isn't there. There is a conspiracy of silence around me...".

His suicide was no accident. In a state of helpless rage over the impossibility of changing anything after a routine discussion with those "upstairs", Georgiy Nestorovich threw himself out of a clinic window.

I have experienced myself the capacity of the ruling comrades not to listen to what they didn't want to hear, not to observe the inconvenient.

I recall how we diagnosed one of the hereditary diseases, phenylketonuria, for the first time in this country. It had not previously been encountered in our practice. I went to the Ministry of Health and said: "This disease is cured by diet; we need to buy the treatment diet abroad for the caretaker; it's not produced here." This was their answer to me: "Vyacheslav Aleksandrovich, perhaps we won't make this diagnosis at all for the time being?..."

And here is an example from the recent past, when the presence in the country of a virus, the cytomegalic virus, which is very dangerous for newborns was announced for the first time. When it enters the organism of the future mother, it literally devours the fetus.

A World Health Organization report was published in 1979 in the "WHO Chronicle" on the way the insidious virus was spreading throughout the world. And as far back as 1975 the WHO had allocated 19 laboratories out of its own resources to investigate the disease and combat it. The United States obtained four laboratories, the European countries about 10, and Africa five. They were also offered to the Soviet Union. But our country proudly declined: We didn't have this disease, everything was fine here.

Investigations of the virus were going on everywhere in the world, and means of combatting it were being sought. But here at the Ministry they said: "Why waste money if there is no illness?" Then the disease was identified. So they used a well-tried ploy—they classified the data on the disease. And this is the result: This diagnosis is made in one out of every three premature infants.

Today, thank God, the statistics are being declassified. Just as though they had awakened from hibernation, they have started talking about the very high child mortality rate. But, after all, you can't just talk; you have to take measures as well. And at the governmental level, above all.

Our maternity homes have never before been in such a deplorable state. There are no medications, equipment, tampons, ordinary bathing. How is a little one going to be cared for there? Quite recently they were providing for

the maintenance of an infant... four kopecks! And if the child became ill, it was necessary to take from the meager resources allowed for the treatment of the mother. It is hard even to imagine this. After all, the first minute, the first day, the first week, these are the most difficult in the life of man. The major percentage of the mortality is at this point; it is here that the majority of diseases have lurked which can then become a cause of death.

A group of pediatricians traveled to Chita recently. There is one respiratory apparatus there for all the maternity homes. There are no instruments for measuring the arterial blood pressure of the newborns. I myself brought such an instrument from France. The entire Filatov Hospital is using it.

Let me cite a few more figures which suggest the lamentable situation of pediatrics. At the present time there is a disturbance in the state of health in 75.1 percent of lying-in women; in 54.3 percent there is obvious pathology. And how can these future mothers be healthy if they are breathing God knows what, are eating incorrectly, and don't have enough to eat? If they lug a lot of weight around, travel in overloaded transport, cling to any kind of work beyond their strength.

Now the Russian Academy of Medical Sciences has prepared proposals for getting out of the blind alley in which pediatrics has found itself. We have sent them to the Russian government. The alarming statistics have been cited.

The country has become democratic, freedom is on the rise. Thus, perhaps it is time for us to publish in the "Declaration of the Rights of the Child", adopted by the General Assembly of the UN in 1959, in the general press. For 33 years, the lifetime of Jesus Christ, it was considered in this country to be "secret".

The rights of all children, patients, and the disabled are spoken of in this humane document. Pediatricians must base themselves on it in their activity; it can also serve as a bill of indictment against those who have violated it.

The physician is not God. He has to decide how to treat, not who is to live. And the criteria are very unclear in that regard, all the more so since a diagnosis when a child is born can be in error. I could cite many examples in which physicians were convinced that a child was defective, yet it (with the appropriate treatment, of course) grew up to be intelligent and healthy. Already there have even been parents who, frightened by a diagnosis, have declined to take the child home, and we at the Filatov have nursed it; after a month, after half a year the child began to develop normally, and when we reported this to the child's parents, they came to pick up the child with tears of repentance and gratitude.

I need not mention that the USSR did not even subscribe to the 1975 WHO Convention on the care of premature infants. Not only was it not published here, but even today people are afraid to mention it. For after all, it is stated there that a fetus weighing 500 or more grams is

already a child and possesses full human rights, and the right to live, above all. It must be rendered medical assistance in a timely fashion and in full measure. Here, on the other hand, we care for a premature newborn if it has achieved a kilogram of weight. If it is 999 grams, no need to worry, the child mortality statistics will not be spoiled. Yet all over the world, many such little ones, born since 1975, that have been cared for are already finishing school...

**How can these future mothers be healthy if they are breathing God knows what, are eating incorrectly, and don't have enough to eat? If they lug a lot of weight around, travel in overloaded transport, cling to any kind of work that is beyond their strength.**

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### Interview With Biopreparat Official

937C0102A Moscow PRAVDA in Russian 15 Oct 92 p 4

[Interview with Prof. Yuriy Tikhonovich Kalinin, doctor of technical sciences and chairman of the board of the state concern Biopreparat, by Vitaliy Kaysyn, under the rubric "Top Secret": "Drugs: A Defense, or a Weapon?"; first two paragraphs are source introduction]

[Text] Many legends have sprung up about the concern Biopreparat. One respected newspaper wrote this about it: It's the same "civilian" roof under which military officials in civilian clothes keep the country on the brink of a bacteriological war.

Not very long ago, according to our information, Biopreparat was actively collaborating with the Ministry of Defense, carrying out special assignments for the ministry. What are the scientists and specialists of the concern doing today? The chairman of the board of the state concern Biopreparat, Prof. Yu. Kalinin, a doctor of technical sciences, talks about that for the first time ever on the pages of a newspaper.

[Kaysyn] Yuriy Tikhonovich, what in fact is the concern Biopreparat, and what is it doing today?

[Kalinin] Our concern is a voluntary association of enterprises interacting on a cost-accounting basis. Its activity is regulated by a charter that was approved by a council of the directors of the member enterprises of the concern. The main aim of the activity of the concern, despite the many conjectures and allusions, is to meet the needs of the country's health care and people for modern diagnostic and treatment-prevention agents and medical articles. Also, to meet the needs of sectors like agriculture, the food and light industry, and machine building for biological preparations. The total volume of output is about 12 billion rubles [R] worth.

[Kaysyn] That's like your business card. But what specifically do you produce?

[Kalinin] Drugs make up most of what we produce (70 percent of the total volume of output). Not a single hospital could get by without the preparations we make.

After all, antibiotics and blood substitutes are both absolutely endemic to surgeries. A large volume of the medications we produce are endocrine preparations and diagnostic systems meant for detecting infectious disease agents and for performing biochemical analyses. We try to deliver them in complete kits, with a set of reagents and laboratory ware and instruments. The enterprises of the concern manufacture nearly a thousand products.

[Kaysyn] The assortment is broad. And the volume of raw materials used by your concern is apparently immense. Today, conversations about raw materials are often accompanied by groans. Have you managed to "keep from groaning"?

[Kalinin] Well, the situation in our sector is also alarming. The disruption of cooperative ties and the rise in prices for energy carriers is also forcing us to raise our prices. And when you consider that our consumers consist of the most poorly defended strata of the population, health care agencies and the rural areas, then it becomes clear why even scarce products go unclaimed and, as a result, create a difficult financial situation for the enterprises of the concern. Our consumers owe us nearly R2.5 billion for delivered products. We, in turn, owe the suppliers of raw materials, other materials, and articles to make up kits nearly R2.0 billion. More than R1.2 billion worth of unshipped product has accumulated at the warehouses of the enterprises—primarily drugs and disposable syringes.

[Kaysyn] How are you surviving?

[Kalinin] Despite the difficulties, we still haven't allowed production to decline appreciably, and the level of production for such vitally important drugs as antibiotics is being kept at the 1990-1991 levels. Every day, it becomes harder and harder to operate, but more interesting, too. But we're surviving like this. First of all, we never became involved in administration by injunction—we've had economics-based business relationship with the staffs of the enterprises. Second, we have a solid scientific-production potential—working in the organizations of the concern are more than 1,000 highly skilled specialists (academicians, professors, doctors of science, candidates of science, and highly skilled production organizers).

[Kaysyn] Yuriy Tikhonovich, one question is always on the tip of my tongue...

[Kalinin] I know—biological weapons? I'll answer it, but in due course. That question is posed to us rather often in meetings and on the pages of the press. With scientists, things are simpler: We invite them to visit our enterprises, and after that, generally, they have only a mutual desire to collaborate. It's more difficult with journalists, who, in not going to the source, prefer to publish unverified information. Specialists are aware that in the 1960's and 1970's, our country was seriously behind in one of the most important technologies determining scientific-technical progress—biotechnology. If you consider that the first steps in genetic engineering in



the West were accompanied by large-scale advertising of its "unlimited" possibilities for the economy and for health care, then the expeditious measures taken by the leadership of the country at the time become understandable. A number of decrees were adopted at that time regarding the creation of a powerful scientific-production base for basic research. I'm referring to the biological center in Pushchino-na-Oke; the Siberian departments of the Academy of Medical Sciences and the Academy of Agricultural Sciences; and the centers for the production of modern medical, veterinary, agricultural, and food preparations created with modern biotechnology techniques, particularly gene engineering. The task—to bridge the gap between the results of basic research and industrial production—was assigned to the newly created All-Union Scientific-Production Association Biopreparat. Its institutes and enterprises have always worked in close contact with the leading scientists and specialists of the country. That very cooperation among scientists and practitioners enabled the creation, in a relatively short period of time, of a material-technical base for operations involving the creation of preparations health care needed by means of the so-called recombinant technologies.

[Kaysyn] But still, what do you do for the military?

[Kalinin] A powerful and modern scientific-production potential like ours is, understandably, also used in the interests of the defense of the country against weapons of mass destruction. In the event of war, our medical enterprises have mobilization assignments involving drugs; systems for taking, transfusing, storing, and transporting blood; blood substitutes; disposable syringes; and other medical products. Of course, all the products must meet the most advanced requirements. Our scientists and specialists are working on that.

Moreover, in the interests of the Russian Federation Ministry of Defense, research is being done on biological aerosols, diagnostics, and the development of vaccine preparations—including genetically engineered preparations—for the prevention of dangerous infectious diseases of viral and bacterial etiology; technologies and equipment are being developed for their production; and instruments for specific and nonspecific indications are being designed, as are automated warning devices.

[Kaysyn] Could you say a few words about the spending for those things?

[Kalinin] They do not exceed one percent of the total budget of the concern. The activity of the NIU [not further expanded] that are part of the concern and take part in such research is regulated by the Russian government's international obligations and the corresponding legal standards.

[Kaysyn] Forgive me, I interrupted your story with my "obsessive interest."

[Kalinin] Well, I think the readers of PRAVDA will be interested to find out that as far back as in the early

1980's, the efforts of scientists and specialists of the Academy of Sciences, the Academy of Medical Sciences, and institutes of our concern resulted in the creation of the first genetically engineered interferon, which gave a cure to many oncology patients. Production of the preparation was set up at three enterprises of our concern—in Vilnius-Kaunas, Novosibirsk, and Obolensk. But more than anything else, the role of the concern showed up in the initial stages of the organization of the fight against AIDS. Many tasks associated with this complex problem were performed right in our enterprises. Within two years, we managed to eliminate the shortage of test kits, instruments, and disposable syringes. Had it not been for such potential and the financial support of the state, many millions of foreign exchange rubles would have had to have been spent on those problems for the acquisition of the proper preparations and articles via import. You can imagine what threatening dimensions AIDS might have presented for our country, had not measures been taken in a timely manner. Here's another example: Everyone knows how any natural disaster is accompanied by a rise in infectious morbidity and by epidemics. During the earthquake in Armenia, that didn't happen. And that was largely due to the fact that as soon as the Ministry of Health asked, vaccines, sera, and other needed immunobiological preparations were sent out of the mobilization reserves of the concern's enterprises to Spitak and Leninakan. And at the same time, the stocks were replenished through the round-the-clock activity of the enterprises and the existing raw-materials reserves. Today, unfortunately, such prompt response can only be dreamed of.

[Kaysyn] This is the question: What about Biopreparat and the market?

[Kalinin] Our potential gives us not only big dividends, but also the capability of rapidly maneuvering in the reorganization of production. And that means, responding rapidly to changes in market requirements. One of the most important factors of our survival is the active participation of the concern's enterprises and institutes in virtually all national programs in health care and the economy that are funded by the government even now, in this time of such difficulties for the country's economy. Such programs include the Human Genome program, the Highly Efficient Processes for the Production of Food program, the Motherhood and Childhood program, the Diabetes program, the Control of the Most Widespread Diseases Program, the Emergency Measures to Neutralize the Effects of the Chernobyl Accident program, and the AIDS program.

[Kaysyn] Tell us about marketing and management as pertains to your concern.

[Kalinin] We are forecasting supply and demand in the sphere of activity that involves us, and we are developing programs for the development of the enterprises by conducting independent studies of them. We have just finished a big project involving the creation in Russia of the production of infusion solutions and systems for

taking, transfusing, and storing blood and blood substitutes. The project has received the support of government structures. We are now beginning to implement it. Ultimately, we plan on not only meeting the needs of the country for the products, but also making a profit.

[Kaysyn] Are you collaborating with any Western structures?

[Kalinin] The concern includes about 10 joint ventures inside and outside of Russia. Foreign firms are attracted to collaboration with us by the high level of our scientific-technical achievements and by the high level of business responsibility we assume in meeting our contract obligations. Last year alone, nearly 1,000 foreign scientists and specialists visited organizations of the concern. Because the demand for products manufactured by enterprises of the concern have grown sharply. The concern prepared contracts for the delivery of, or sold, antibiotics; microbiological plant-protection agents; endocrine and genetically engineered preparations; amino acids; and biochemical reagents to the United States, England, Spain, the Korean People's Republic, Yugoslavia, Mongolia, India, and countries of Eastern Europe. We are participating in the realization of a number of projects for the country's health care sector involving foreign credit; we are also making broad

use of the proposals of domestic commercial structures that are profitably investing capital in our enterprises, and in turn we are getting the opportunity to modernize our production capabilities.

[Kaysyn] And the last question. What are your relationships like with enterprises that are just outside our borders?

[Kalinin] We have managed to keep in the concern all the enterprises located in Belarus, the Baltic states, Uzbekistan, and Kazakhstan. With the governments of Lithuania, Belarus, and Uzbekistan, the concern has signed agreements in which the enterprises of those governments maintain their membership in the concern on the basis of mutually beneficial economic and scientific-production cooperation. A similar agreement has been prepared and is under study with the government of Kazakhstan. Such documents are mutually beneficial, because they make it possible for us to produce for Russia drugs that are manufactured by enterprises in CIS countries. And Russian enterprises, in turn, are fulfilling their obligations completely in terms of deliveries for 1992 to the countries just outside our borders.

[Kaysyn] Thank you for the conversation.

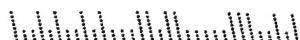


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